UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-01

GENERAL AVIATION SAFETY

A. LECTURE NUMBER: G-01

B. TIME: 1 HOUR

C. DATE PREPARED: 1 NOVEMBER 1989

D. DATE REVIEWED: 7 February 1997

E. TITLE: GENERAL AVIATION SAFETY

F: OBJECTIVE: To familiarize maintenance personnel with proper safety procedures within the aviation maintenance environment. This lesson will familiarize personnel with shop safety and hangar deck safety.

G: INSTRUCTIONAL AIDS:

1. Mech/Crossfeed Magazine Distributed by NAVSAF center Norfolk Va.)

2. Training Films (That may be checked out at your Station Audio/Visual Center)

3. Local TYCOM instructions

H: REFERENCES:

1. OPNAVINST 4790.2_

2. NAVFAC P-309

3. NA 00-80T-96

4. Local Command Procedures

I: PRESENTATION: A good conscientious Safety Program as outlined in reference (a) is developed through awareness and knowledge that hazards in the maintenance area are real and always have a potential to inflict serious and even fatal injuries to ourselves and our co-workers. Safety is always a major concern in all activities. Regulations are established to be observed by all personnel that enter a shop space or walk out onto the Hangar Deck. Safety does not discriminate between grade, creed or religious preference. Accidents can occur to anyone, at anytime.

Potential for accidents always exists and can be set in motion hours, days, or weeks in advance, requiring only individual action or inaction to initiate occurrence. The objective of all safety procedures and regulations is to remove those potentially hazardous environments and provide maintenance personnel with the safest working environments possible. This will be accomplished through maintenance personnel reading and observing all posted areas, identified hazards and written regulations.

1. Shop Safety:

    a. Good Housekeeping:

        (1) Keep all work areas clean. i.e. free of oil, fuel and debris that could contribute to falling, tripping or slipping.

        (2) Keep heavy objects stored where they can be handled easily and do not put personnel in a dangerous position to handle them.

        (3) Keep shop fire lanes and escape routes clear.

        (4) Maintain all shop equipment assigned, by performing periodic maintenance as required. In addition ensure appropriate safety hazards are identified as per reference (b).

        (5) Ensure qualified personnel operate shop equipment and that all equipment safe guards and personnel protective equipment is utilized.

2. Hangar Deck Safety:

    a. Good Housekeeping:

        (1) Keep assigned hangar deck spaces and work areas free of spills such as oil, hydraulic fluid, fuel and debris, which could contribute to an accident.

        (2) Keep fire lanes clear and all fire fighting stations clear.

(3) When opening and closing hangar doors ensure they are clear and they are in working order prior to operation. DO NOT open and close hangar doors utilizing tow vehicles, this creates a very hazardous condition.

(4) All hangar deck eye wash stations/showers should be clearly marked and maintained. Keep areas clean and clear.

(5) Observe all identified safety areas peculiar to your hangar deck. These may vary depending upon your activities hangar space.

(6) Ensure hangar decks are kept free of FOD.

b. Aircraft Safety in the Hangar:

(1) Aircraft that are in the hangar shall be grounded and chocked at all times.

(2) Movement of aircraft in and around the hangar shall be performed with the appropriate number of qualified personnel to safely position the aircraft.

(3) Ensure all de-arming procedures have been observed for ejection seats, canopies and weapon stations as applicable to the maintenance to be performed.

(4) Disconnect battery as applicable to T/M/S.

(5) Install all protective devices for aircraft, as well as for the workers personal protection.

(6) Utilize drip pans as appropriate to contain leaks in any fluid system.

(7) Clean drip pans after maintenance and dispose of hazardous waste in "Designated Areas Only". Improper disposal of hazardous waste will put your personnel/activity in violation of Environmental Protection Agency (EPA)/Local regulations.

(8) Any maintenance activity occurring on the hangar deck, which may directly affect the personnel in the hangar, should be posted or roped off. i.e. painting (touch-up) that involves the use of hazardous paints, aircraft which have been placed on jacks and any area where a fuel system may be opened.

(9) Maintenance Control in your activity may place the hangar deck "Off Limits" during some maintenance evolutions or may not allow certain tools or equipment to be operated while a maintenance task is being performed, (i.e. during de-puddling of fuel cells or when paint spraying is in progress).

3. Mobile Maintenance Facility Safety (MMF):

a. Good Housekeeping:

(1) Keep workspaces clean.

(2) Keep aisles clear and ensure easy access to fire extinguishers.

b. Safety in and around Mobile Maintenance Facilities:

(1) Be aware of all possible trip hazards.

(2) Be aware of low doorways and ceilings.

(3) Ensure doors are unlocked to allow easy exit in case of fire.

(4) Ensure MMF is properly secured to pad eyes or stakes.

(5) Ensure MMF is properly grounded to EARTH GROUND.

(6) Observe all identified safety areas peculiar to MMF such as:

(a) Radar area.

(b) ESD safe areas.

(c) High voltage areas.

4. Responsibilities:

a. Quality Assurance:

(1) Quality Assurance is assigned the overall responsibility for the Maintenance Department Safety Program. Their program requirements include the following:

(a) Disseminating appropriate safety posters and literature.

(b) Reporting all hazards, mishaps and unsafe practices in the department.

(c) Conducting safety meetings within the department monthly.

(d) Coordinating with the Aviation Safety Officer.

(e) Participating in the activity's safety surveys and stand-downs.

b. Work Center Supervisors:

(1) The work center supervisor is responsible for assisting Quality Assurance in the following areas:

(a) Providing safety posters and literature to personnel.

(b) Reporting all accidents and unsafe maintenance practices in the department.

(c) Conducting safety training within the work center.

(d) Participating in safety surveys and safety stand-downs within the activity.

(e) Using and promoting practices that enhance safety while instilling proper regard for

safety considerations in supervised personnel.

(f) Ensuring personnel are currently qualified in egress system safety/checkout and that records are maintained in the work center as specified in reference (a) Chapter 10.

c. Maintenance Personnel:

(1) All maintenance personnel will attend all safety training, stand-downs and participate in safety surveys as directed.

(2) Be familiar with safety precautions peculiar to shop and hangar deck operations.

(3) Observe all Maintenance Instruction cautions, notes and safety measures as they apply to the task being performed.

(4) Read Mech/Cross feed Magazine when available. This publication has many helpful tips on safety and maintenance, which may enhance your particular shop or division’s safety effort.

J. SUMMARY: The Safety Program is more diversified than the areas that are covered in this lesson, however the information covered here today is designed to give you the maintenance man/woman the basics of a Maintenance Department Safety Program as it applies to shop practices and hangar deck operations. The scope of safety is vast in that it affects everything we do in our everyday maintenance and activities. These other areas of importance will be covered in other lessons such as this one.

K. QUESTION AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-02

TECHNICAL PUBLICATIONS LIBRARY

A. LECTURE NUMBER: G-02

B. TIME: 1 Hour

C. DATE PREPARED: 1 November 1989

D. DATE REVIEWED: 7 February 1997

E. TITLE: TECHNICAL PUBLICATIONS LIBRARY

F. OBJECTIVE: To familiarize personnel with the responsibility, types, and procedures of a technical publications library.

G. INSTRUCTIONAL AIDS:

H. REFERENCES:

1. OPNAVINST 4790.2_
2. NAVAIR 00-25-100
3. NAVAIR 00-25-300
4. COMNAVAIRLANT/PACINST_

I. PRESENTATION: The Technical Publications Library (TPL) serves two important functions. First it provides a positive source of reference information to facilitate personnel training and individual improvement. To be effective, the technical library must contain copies of all technical manuals applicable to the assigned aircraft maintenance level and it's related systems and equipment. The TPL is established as a centralized control point for all technical manuals used in aviation maintenance. A technical manual is defined as a publication or other form of documentation containing a description of weapon system, component, or support equipment with instructions for their use and maintenance. Technical manuals are essential to specialized equipment procurement of logistics support; the technical manual is a maintenance tool. An acceptable technical manual is one that can be employed with ease and confidence and is a document that is usable in both the training and maintenance environment. It will imply and accurately define the equipment and describe the maintenance concept and configuration of the item under test or repair.

1. LIBRARY RESPONSIBILITY.

    a. Activity Commanding Officers are responsible for the development, establishment, and operation of technical library services in support of local operations and maintenance. He shall appoint a Technical Publications Officer (TPO) to manage this necessary function. Of initial interest is the designation of a Central Technical Publications Library (CTPL) to control all technical publications within the command, including the establishment and operation of Dispersed Technical Publications Libraries (DTPL). In accordance with technical publication policy and type commander direction, he shall issue local library regulations, establish a management and control system assigning personnel resources, and provide for library inspection as he deems necessary.

2. TYPES OF LIBRARIES.

    a. To be effective, the Technical Publication Library must be a centrally managed function. Therefore, based on activity organization, there will normally be two types of libraries as dictated by need.

        (1) CENTRAL LIBRARY.

            (a) When more than one library is required to satisfy local requirement, a central technical publications library (CTPL) shall be established to coordinate and manage technical publications functions. This library shall be solely responsible for the analysis of an activity's requirements, procurement of documents, receipt and local distribution, security compliance and maintenance and update of all technical publications under the cognizance.

            (b) Management of the technical library is a function assigned to the Quality Assurance (QA) department or division. The Quality Assurance Officer shall monitor the overall operation of the CTPL and shall

assume the duties of Technical Publications Officer if assigned by the Commanding Officer.

NOTE:
CLASSIFIED MATERIAL CONTROL OFFICER SHALL HAVE OVERALL CONTROL OF ALL CLASSIFIED PUBLICATIONS MAINTAINED BY THE MAINTENANCE DEPARTMENT, AND WILL COORDINATE DISTRIBUTION AND CUSTODY OF CLASSIFIED PUBLICATIONS WITH THE QUALITY ASSURANCE CTPL CLERK.

1 CTPL Responsibilities.

a Establish a Maintenance Instruction using the guidelines established in the NAVAIR 00-25-100 manuals.

b Maintain a Central Library including a Master File of all original publications.

c Requisition, receive, screen and distribute all incoming technical publications.

d Establish procedures to do follow-ups on requisitions over 45 days.

e Establish dispersed libraries.

f Maintain all original copies of Maintenance Instructions.

g Maintain a training program for assigned library personnel, including dispersed librarians.

h Establish and maintain a program to audit the Central Library annually and dispersed libraries quarterly, as a minimum.

i Utilize or develop an effective checklist IAW Ref. (d), so that discrepancies can be properly identified during an audit. Audit findings and corrective actions should be maintained for one year.

j Establish a program to control and maintain Technical Directives to include the use of the NA 00-500 Series and Weekly TD Summary.

k Review, number, distribute and forward to IMA/Wing all local MRC's.

l Coordinate with Squadron NATOPS Officer for the issue and upkeep of all NATOPS manuals and pocket checklists.

m Order, receive, distribute and maintain a master file of all Technical Directives.

n Maintain the activities automatic distribution requirements utilizing the NATSF Technical Library Program.

2 CTPL Control of Publications.

a Control of publications will be maintained in accordance with reference (b).

1. The Naval Aviation Technical Services Facility (NATSF) Technical Publication Library Program.

a. The implementation of the A.T.I.S. (Automated Technical Information System), the A.L.T.M.S. (The Automated Library Technical Manual System), and the current NATSF TPL PROGRAM version has made the CTPL's job much easier. The current NATSF version has given the CTPL the capability to run the entire TPL program on computer, and has allowed the user to accomplish the following list of daily functions of TPL:

b. Run ADRL option and submit disk (done at least every 12 months).

c. Run DEAD FILE report (done at least quarterly).

d. Run ERROR listing report (done at least quarterly).

e. Use to generate CECR's to issue publications (computer prints out entire CECR card).

f. Use to generate MILSTRIP data.

g. Run daily routine report daily.

h. Maintain current copy of complete library listing (computer places every publication in alpha-numeric order). With this you always run a new listing on ADRL submission.

i. Run automated audit against NAVSUP PUB 2002 on NAVSUP PUB 600. (Naval Logistics library CD-Rom).

j. Run locator listing for each work center at least quarterly.

k. Run work center listing for each work center at least quarterly for work center audit.

l. Keep a computer located tickler file.

2. The major area of the NATSF is the View and EDIT field, this fields holds all pertinent information of all the publications that the CTPL holds. From this field, the user can carry out a variety of functions. Each function is self-explanatory and is called up by a first letter touch system. The system is user friendly and one shouldn't have any problems with it.

3. A locally procured stamp shall be used on each

publication. The stamp shall include, as a minimum the following items of identification.

a. Activity

b. Copy Number

c. Location

4. The stamp will be placed on the title page that identifies the date of the publication.

5. For Technical Directives and Rapid Action Changes, the stamp shall be placed on the first page.

6. The CTPL will establish a simple numbering system for all manuals under CTPL control.

7. Dispersed libraries require only a visible, ready accessible list for publications and their location (report 3 from the NATSF TPL Program works nicely).

3 Incorporation of Changes to NAVAIR Technical Publications.

a There are three approved methods of updating technical publications.

1. Changes - Changes consist of official release of updated pages of an existing manual. The user removes the superseded pages and inserts the new

material within five (5) working days.

2. Revision - Revision is a complete reissue of a manual with all change information incorporated.

3. Rapid Action Changes (RAC's) - RAC's consist of three types and they must be incorporated within two (2) working days.

   a. Type 1A Interim RAC – Interim RAC is prepared as a message to cover urgent change data requiring immediate dissemination.

   b. Type 1B Interim RAC - Another Interim RAC is prepared as a printed change to cover urgent change status such as changes to wiring diagrams, schematics and other illustrations that cannot adequately be transmitted by message.

   c. Type II Formal RAC - Formal RAC is prepared only as a replacement for Interim RAC's when time is available for reproduction.

4 Storage and identification of publications held by the CTPL.

a Each manual/directive received will be placed in the appropriate binder.

b When more than one manual or type directives are placed in the same binder, the lowest NAVAIR manual or type directive number shall appear first on the outside spine followed by the term "thru" and ending with the highest manual or type directive.

c After filing, the binders are stored on shelves as follows:

1. Manuals shall be arranged alpha-numerically by NAVAIR publication numbers.

2. Technical directives shall be filed by type aircraft/equipment.

3. Publications other than NAVAIR may be filed in separate binders under appropriate general heading.

4. MRC Decks shall be stored inappropriate card index containers in alphanumerical order.

NOTE:
IAW REF. (a) ALL QA REQUIREMENTS WITHIN MRC DECKS SHALL BE DESIGNATED AS CDI, CDQAR, QAR REQUIREMENTS. CONSULT YOUR QA SECTION FOR THE PROPER REQUIREMENTS WITHIN YOUR MAINTENANCE DEPARTMENT.

5. Instructions and notices shall be filed in separate binders in standard subject identification code sequence. An additional breakdown by major echelon, i.e. type commander, wing, etc., is also authorized.

6. Nonstandard size manuals should be stored in appropriate containers, conveniently located for ready use and the location noted on the NWPL cards.

5 Change Entry Certification Record (CECR) OPNAV Form 5070/12.

a The CECR form is used as a record by the CTPL to ensure that changes and revisions to publications have been issued to all dispersed libraries.

b CTPL shall establish procedures whereby changes and revisions to technical manuals are picked up on a daily basis.

c The CECR is a receipt for:

1. The issue of a change or revision to be incorporated by the holder of the publication.

2. The CTPL indicating a change/revision has been issued for incorporation to a specific manual held by a designated work center.

d The CTPL will incorporate the change as soon as it is received. Use of the CECR form

by the CTPL is not required on central library copies.

NOTE:
RECOMMEND THAT THE QAR REVIEW CHANGES APPLICABLE TO THEIR AREA OF EXPERTISE PRIOR TO THEIR INCORPORATION INTO THE MANUALS OF THE CTPL (i.e. AIRFRAMES QAR REVIEWS CHANGES TO THE AIRFRAMES MANUALS).

e The CTPL shall establish and train the dispersed librarians in the use of the CECR and the proper methods of making various types of changes to publications.

6 Audits.

a CTPL will be audited annually by QA.

b The CTPL will perform a Quarterly Audit on all dispersed libraries.

c Additional audits will be conducted when:

1. Directed by a competent authority.

2. A new work center supervisor is assigned.

3. A new dispersed librarian is assigned.

d The primary intent in conducting these audits is to ensure that new work center supervisor or dispersed librarian will maintain some degree of

continuity between the work center and CTPL.

(2) DISPERSED LIBRARIES.

(a) When a central library is so designated within the command, all other libraries shall be considered Dispersed Technical Publications Libraries (DTPL), subordinate to, and under the management control of the central library. The central library is responsible for the initial outfitting and issue of updated material to the dispersed libraries. However, their "branch" operations are responsible for the storage and user availability of the documents issued to them. In the event additional information or technical manuals are required, all requests should be made through the central library.

1 The Quality Assurance CTPL clerk shall establish and control the DTPL in accordance with reference (b). He will also coordinate the distribution of classified publications with the Classified Materials Control Officer. The Quality Assurance CTPL clerk must be completely familiar with reference (b) and all subordinate instructions concerning the DTPL. If a security clearance is not held, he must initiate action to receive such a clearance to a degree that allows access to all publications pertaining to the Maintenance Department.

2 Work Center/Division Supervisors shall designate in writing to the Quality Assurance Officer, a responsible Non Commissioned Officer as the Work Center/Division DTPL clerk. The supervisor will assist the Work Center/Division DTPL clerk as needed and will notify the Quality Assurance CTPL clerk of a change of Work Center/Division DTPL clerks to

ensure a smooth turnover in the operation of the dispersed libraries.

3 DTPL Responsibilities.

a. The following list of responsibilities are associated with a dispersed library:

1. NCOIC's are responsible for scheduling Dispersed Librarians to the appropriate FASO course.

2. Work Center Supervisors are responsible for informing the Central Library Clerk of additional manual or change requirements and replacement of damaged manuals.

3. Dispersed Library functions shall be a collateral duty assigned to an individual in the work center by the work center supervisor.

4. Dispersed Libraries will be responsible for the storage, update and user availability of the publications issued to them.

J. SUMMARY: The CTPL and it's dispersed libraries are vital and a key to any squadron's operational capabilities. The CTPL's two most important functions are to provide a central source of up-to-date information for all personnel and to provide a source of reference information to assist the individual in both training and self-improvement.

K. QUESTION AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-03

EMERGENCY RECLAMATION

A. LECTURE NUMBER: G-03

B. TIME: 1 Hour

C. DATE PREPARED: 1 November 1989

D. DATE REVIEWED: 7 February 1997

E. TITLE: EMERGENCY RECLAMATION

F. OBJECTIVE: To familiarize personnel with requirements responsibilities, and procedures followed in the event of aircraft exposure to salt water, fire extinguishing agents or other corrosive materials. Exposure of aircraft structures or components to corrosive elements such as salt water or fire fighting chemicals can be catastrophic. Damage to aircraft can be substantially reduced through immediate initiation of reclamation procedures. Speed, thoroughness and advanced knowledge of reclamation procedures are essential.

G. INSTRUCTIONAL AIDS:

1. Applicable Squadron Maintenance Instruction (s)

2. Emergency Reclamation Team Kit

H. REFERENCES:

1. NA 01-1A-509

2. NA-15-01-500

3. NA 16-01-540

4. OPNAVINST 5100.23B

5. NA A1-NAV0SH-SAF-000/P5100

6. 4790.2_

I. PRESENTATION:

1. Assignment to the Emergency Reclamation Team.

    a. A reclamation team shall consist of the corrosion control prevention officer, the corrosion team, and

a designated team member from each work center. Team personnel will have successfully completed the required Corrosion Control course. The reclamation team shall respond to direction from Maintenance Control, accomplishing salvage operations and corrosion control as assigned.

b. The Corrosion Control Officer shall organize and direct all assigned salvage operations. Additional personnel will be assigned to the Corrosion Control Officer to assist in salvage operations as required.

2. Responsibilities.

a. All team members shall be familiar with the basic techniques used for preservation of all aircraft components in case inter-shop assistance is needed. The immediate action checklist will be implemented upon initial notification that the aircraft has been exposed to corrosion.

b. The Maintenance Control Officer is charged with notifying the following personnel, Maintenance Officer (who will then notify the Commanding Officer and the Executive Officer), Corrosion Control Officer, Quality Assurance Officer, and the Avionics Officer. He will ensure a logbook entry is made. He will ensure all parts/components removed from aircraft are properly tagged with water/crash/fire damage tags and that an in-depth corrosion inspection is performed during the next phase inspection or corrosion inspection, whichever comes first.

NOTE:
DATA WILL BE SUBMITTED BY MESSAGE WITHIN 35 WORKING DAYS SUBSEQUENT TO AIRCRAFT EXPOSURE TO LARGE QUANTITIES OF SALT WATER OR CORROSIVE FIRE EXTINGUISHING AGENTS. THIS MESSAGE WILL BE PROVIDED TO THE COGNIZANT WING COMMANDER AND *COMNAVAIRPAC, COMNAVAIRLANT*, OR *COMNAVAIRESFOR* AS APPROPRIATE.

c. Quality Assurance. The corrosion control monitor will be the on-the-scene Quality Assurance Representative (QAR) during the reclamation effort. QAR's will inspect their respective areas prior to the next flight ensuring that all corrosion contaminants have been removed or treated. The Quality Assurance Officer shall review reclamation results and advise the Maintenance Officer thoroughly and make recommendations for continued flight.

d. The Safety Officer will, if the aircraft is impounded by an Accident Investigation Board, coordinate with the Maintenance Control Officer to ensure that emergency reclamation procedures are promptly initiated when the aircraft is released for reconstruction.

e. All personnel assigned to the Corrosion Control/ Emergency Reclamation Team will be on the Respiratory Protection Program. Current Physicals & Fit tests will be required.

f. During all ERT operations, all required personal protective equipment would be used. The ERT kit shall contain goggles, face shields, aprons, rubber gloves, overalls, boots and any other equipment needed for the T/M/S aircraft on hand.

g. Corrosion Control will perform the following:

(1) The Corrosion Control Officer will be the on-scene coordinator for the reclamation. He is charged with ensuring that timely and thorough restoration procedures are followed in accordance with maintenance instruction (s).

(2) The Corrosion Control Officer will ensure that all members of the corrosion control team and work center corrosion control representatives are thoroughly familiar with the contents of applicable maintenance instruction (s).

(3) The Corrosion Control Supervisor shall act as the on-scene assistant to the Corrosion Control Officer and Maintenance Control Officer.

h. Maintenance Control shall:

(1) Call out the emergency reclamation team upon notification that an aircraft has been exposed to significant quantities of corrosion inductive element.

(2) Draft the report using technical data provided by the emergency reclamation team supervisor.

(3) Alert the supporting IMA.

(4) Provide administrative assistance in preparing logs and records, entries and other maintenance administrative support. This will include providing a block of job control numbers (JCN) for use by the team.

i. Emergency reclamation team supervisor shall:

(1) Supervise the actual reclamation work.

(2) Perform on-site maintenance control duties.

(3) Ensure repairable components requiring reclamation are expeditiously processed to IMA.

(4) Prepare and maintain an inventory of required materials. Ensure the aircraft is made safe for maintenance, (re. remove ordnance, deplete oxygen, deplete nitrogen, remove batteries, de-fuel aircraft, GFE as required).

(5) Component removal priority lists are designated. Components will be cleaned by the team and picked up by the designated shops for inspection, tagging, maintenance or preservation. The emergency reclamation tool/material list will be utilized for all reclamation/crash operations, and shall be maintained by the NCOIC of work center 12C.

j. Weapons/Ordnance and Survival Equipment representative shall locate and identify explosive devices. EOD shall ensure all explosive devices are safe before the commencement of any reclamation work.

k. Reclamation Team members shall:

(1) Conduct reclamation work on all supports.

(2) Remove "I" level repairables for processing. Speed is essential.

(3) Assist with general reclamation as directed.

(4) Each team member shall be responsible for drawing the tools required to remove their respective components.

l. Maintenance Department Division Officers shall ensure personnel assigned are fully qualified on the supported systems and possess the required corrosion control training in accordance with maintenance instruction (s).

NOTE:
WHEN ACTIVATED, PRIOR TO INITIATION OF EMERGENCY PROCEDURES, THE ERT SHALL BE UNDER THE DIRECT CONTROL OF THE SENIOR MEMBER OF THE ACCIDENT INVESTIGATION BOARD. THIS PREVENTS JEOPARDIZING THE ABILITY OF THE ACCIDENT INVESTIGATION TEAM TO DETERMINE THE CAUSE OF THE ACCIDENT.

m. The Avionics Officer will submit all reports on status of COMSEC gear to the MAG Avionics Officer.

3. Reclamation Procedures.

a. Reclamation action must begin at the earliest possible opportunity and conducted as a top priority job. They’re claimed structures and components must encompass all those exposed to the corrosive agent.

b. In the event that more than two aircraft are exposed, additional members of the maintenance department will be assigned to the team as required.

c. Removal of fire extinguishing agents and salt water shall be accomplished.

d. In the event the aircraft is suspected to have been exposed to carbon fibers, the following procedures shall be followed:

(1) Ensure all PPE is used by the ERT as required.

(2) Inspect aircraft and aircraft compartments with a sniffer (if available) or a magnifying glass and sticky tape to pick up samples.

(3) If carbon fibers are not evident, clean up is not necessary.

(4) If carbon fibers are present, clean by vacuuming or washing.

(5) Care should be taken to avoid spreading carbon fibers to uncontaminated areas. All carbon fibers should be collected for disposal.

NOTE:
MARK BAGS WITH THE FOLLOWING:
CARBON FIBER DEBRIS; DO NOT INCINERATE, DO NOT SELL FOR SCRAP -- DISPOSE OF USING EPA GUIDELINES

(6) After cleaning, vacuum bags, rags, cloths, or sponges, together with clusters and single fibers should be bagged, sealed and labeled.

NOTE:
INSTRUCTOR SHOULD REFER TO THE LOCAL SQUADRON MAINTENANCE INSTRUCTION AND PRESENT THE UNITS IMMEDIATE ACTION CHECKLIST REQUIREMENTS.

4. Immediate Action Checklist.

J. SUMMARY: Exposure to aircraft structures or components to corrosive elements such as salt water or fire-fighting chemicals can be catastrophic. Damage to aircraft can be substantially reduced through immediate initiation of reclamation procedures. Safety is paramount; all PPE required would be used. Speed, thoroughness and advanced knowledge of reclamation procedures are essential.

K. QUESTIONS AND ANSWER PERIOD:

NOTE:

THE USE OF COMPOSITE MATERIALS SIGNIFICANTLY COMPLICATES RECLAMATION PROCEDURES. WHEN THESE COMPOSITE MATERIALS ARE SUBJECTED TO FIRE OR EXPLOSION. THE PARTICLES (CARBON FIBERS) WILL BECOME AIRBORNE AND SPREAD. THESE FIBERS ARE ELECTRICALLY CONDUCTIVE AND CAN CAUSE CONSIDERABLE DAMAGE TO ELECTRICAL EQUIPMENT IN AIRCRAFT, BUILDINGS, AND VEHICLES. DIRECT OBSERVATION SHOWS THAT CARBON FIBERS ACT AS A SKIN IRRITANT SIMILAR TO FIBERGLASS WHEN PERSONNEL ARE EXPOSED TO MODERATE OR HEAVY AMOUNTS; HOWEVER, IN THE ABSENCE OF CONCLUSIVE EVIDENCE THAT THE MATERIAL IS BIOLOGICALLY BENIGN, PRECAUTIONS TO REDUCE EXPOSURE TO THESE MATERIALS SHOULD BE MAXIMIZED.

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT AND DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-04

AVIATORS BREATHING OXYGEN (ABO), SURVEILLANCE AND CONTAMINATION CONTROL PROGRAM

A. LECTURE NUMBER: G-04

B. TIME: 1 Hour

C. DATE PREPARED: 21 June 1991

D. DATE REVIEWED: 7 February 1997

E. TITLE: AVIATORS BREATHING OXYGEN (ABO), SURVEILLANCE AND CONTAMINATION CONTROL PROGRAM.

F. OBJECTIVE: To familiarize maintenance personnel with the responsibilities and procedures of managing an effective Aviators Breathing Oxygen (ABO), Surveillance and Contamination Control Program.

G. INSTRUCTIONAL AIDS:

1. Appropriate MIM's, specifications/related engineering directives.

2. Applicable Squadron Maintenance Instructions.

H. REFERENCES:

1. OPNAVINST 4790.2_

2. NA A6-332AO-GYD-000 (NOTAL)

3. NA 06-30-501 (NOTAL)

4. NA 13-1-6.4

5. Local MI

I. PRESENTATION: The purpose of the Aviators Breathing Oxygen (ABO), Surveillance and Contamination Control Program is to achieve and maintain a satisfactory level of contaminant free oxygen in aircraft systems, components and equipment, thus eliminating serious hazards to aircrew.

1. Aviators Breathing Oxygen (ABO), Surveillance and Contamination Control Program.

NOTE:
ALL PERSONNEL ASSOCIATED WITH THE ABO SUREVEILLANCE/ CONTAMINATION PROGRAM WILL HAVE A THOROUGH KNOWLEDGE OF THE CHARACTERISTICS OF LIQUID OXYGEN (LOX) AND GASEOUS OXYGEN, THE HAZARDS OF CONTAMINATION, AND THE NEED FOR QUALITY STANDARDS. ALL PERSONNEL ASSOCIATED WITH THE ABO PROGRAM WILL BE FAMILIAR AND COMPLY WITH THE PROPER SAFETY AND OPERATING PROCEDURES OUTLINED IN *NA A6-332AO-GYD-000* (NOTAL) AND *NA 06-30-501(NOTAL) and NA 13-1-6.4.*

a. Command: Refer to the local maintenance instructions for all command responsibilities under the Aviators Breathing Oxygen (ABO), Surveillance and Contamination Control Program.

b. Maintenance Officer: Responsible for ensuring the monitoring of the Aviators Breathing Oxygen (ABO), Surveillance and Contamination Control Program.

c. Division Officer Responsible for:

(1) Ensuring all oxygen servicing equipment is in proper working order prior to use and all safety devices are in place and function properly.

(2) All operations involving the handling of liquid or gaseous oxygen will be performed by two or more qualified persons except for the removal and replacement of aircraft LOX converters.

(3) The term "qualified personnel" is interpreted as personnel properly trained and licensed to perform all tasks involving LOX and Gaseous Oxygen handling and servicing.

d. Maintenance Personnel:

(1) Personnel charged with working around and maintaining ABO, utilize the technical information and equipment required for safely carrying out the program.

e. QA/A will ensure that:

(1) Proper protective equipment is utilized by the squadron personnel charged with handling LOX.

(2) Aircraft oxygen systems are purged IAW MRC's, MIM's and other directives at intervals specified.

(3) Periodic maintenance is performed on all oxygen servicing equipment in the possession of the squadron to ensure all gear is in good working order and oxygen quality standards are maintained.

(4) Reports of contamination or odors in ABO are promptly acted upon by cognizant personnel.

(5) Only qualified personnel will operate oxygen-servicing equipment.

J. SUMMARY: The objective of the Aviators Breathing Oxygen (ABO), Surveillance and Contamination Control Program is to achieve and maintain a satisfactory level of breathing oxygen purity in Naval aircraft, thereby providing for safe and efficient operation. Control of contamination is therefore a must and all methods of detection and control should be used in accomplishing this objective.

K. QUESTIONS AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT AND DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-05

3M DOCUMENTATION FOR TECHNICAL DIRECTIVE COMPLIANCE

A. LECTURE NUMBER: G-05

B. TIME: 1 Hour

C. DATE PREPARED: 1 November 1989

D. DATE REVIEWED: 7 February 1997

E. TITLE: 3M DOCUMENTATION FOR TECHNICAL DIRECTIVE COMPLIANCE.

F. OBJECTIVE: To familiarize personnel with the proper procedures to procure, document, and to perform monthly closeout and re-initiation procedures of technical directives.

G. INSTRUCTIONAL AIDS:

1. NAVSUP Form 1205

2. VIDS/MAF

H. REFERENCES:

1. OPNAVINST 4790.2_

2. NA 00-25-300 (NOTAL)

3. NAVSUP 2002 (NOTAL)

I. PRESENTATION: Technical Directives (TDs) direct the modification/one-time inspection of all COMNAVAIRSYSCOM (including field activities) procured equipment, in either the contractor's or Navy's possession, and provide for documentation of accomplishment.

1. Technical Directive Compliance (TDC) Documentation.

    a. The Visual Information Display System/Maintenance Action Form (VIDS/MAF) will be used to document all TDC maintenance actions. The TDC VIDS/MAF form is also used by reporting custodians for configuration accounting. Data obtained from the form allows identification of all direct man-hours expended to comply with directives.

    b. Maintenance/Production Control originates the TDCVIDS/MAF. Maintenance/Production Control will

forward copies 1, 3, 4 and 5 to material control, if parts or kits are required, and copy 2 will be forwarded to Quality Assurance. When the parts/kits and aircraft/equipment are available, Maintenance/ Production Control forwards copies 1 and 5 to the primary work center. Maintenance/Production Control holds copy 3 on their VIDS board until the TDC is completed and copy 1 has been received from the work center. If more than 1 work center is involved, Maintenance/Production Control must initiate a separate VIDS/MAF for each assisting work center to document their work on the TDC.

c. The following describes the data entered in each block of the TDC VIDS/MAF. It is important that all information be recorded legibly, accurately, and completely to ensure forwarding of correct information. The TDC VIDS/MAF will be completed in the following manner:

(1) Blocks A08 - A14 - JCN - Enter the JCN assigned by Maintenance/Production Control.

(2) Block A19 - Work Center - Enter the work center code of the work center incorporating the TDC.

(3) Block A22 - Work Unit Code - Enter the complete 5 or 7 character code which identifies the system, subsystem, component, or subassembly /module which was modified by the TDC.

(4) Block A29 - Action Organization - Enter the organization code of the activity expending or who will expend the man-hours necessary to incorporate the TDC.

(5) Block A32 - Transaction Code - Enter as appropriate.

(a) 41 - TD compliance on non-serialized components.

(b) 47 - TD compliance on serialized components with or without part number change.

(6) Block A34 - Maintenance Level - Enter the 1 Character code that identifies the level of maintenance being performed.

(7) Block A48 - Type Equipment - Enter the type equipment code that identifies the type of weapon system, engine or support equipment to which the TDC applies. If the TDC is applicable to the component instead of an end item (s), use the appropriate Y or D series type equipment code.

(8) Block A52 - BUNO/Serial Number - Enter the BUNO/serial number of the type equipment entered in block A48.

(9) Block A35 - Action Taken - Enter the appropriate code from appendix K of reference (a). (Only the primary work center may enter a C, all assisting work centers will report an A).

(10) Block A39 - Items processed - Enter the total number of items processed, not to exceed 99.

(11) Block A41 - Man Hours - Enter the total number of man-hours expended to accomplish the TDC.

(12) Block A45 - EMT - Enter the clock time it took to accomplish the TDC.

(13) Technical Directives Identification Blocks - Enter the 12 or 13 character code that identifies the specific TDC incorporated. This block is divided into 7 sections:

(a) Block F08 - Interim - Enter a (X) mark to indicate an interim TDC, otherwise leave blank.

(b) Block F09 - Code - Enter the two-character code from appendix L of reference (a).

(c) Block F11 - Basic Number - Enter the basic number from the directive.

(d) Block F15 - Revision - Enter the alpha character that denotes the specific revision to the basic TDC. If none, leave blank.

(e) Block F16 - Amendment - Enter the 1 character numeric amendment number of the basic TDC. If none, leave blank.

(f) Block F17 - Part - Enter the two-character alpha/numeric part number of the TDC. If none, leave blank.

(g) Block F19 - Kit - Enter the two-character number of the specific kit incorporated. If none, enter 00.

(14) Blocks E and G - Removed/Old Item, Installed /New Item - Entries are required in these blocks when a G, Y, or D TDC is used with a level 2 maintenance. Use of this block by all other TEC, with the exception of TEC A, is restricted to those times when a part number change is accomplished.

(a) Blocks E08 thru E42 - Removed/Old Item- Enter the manufacturers code, component serial number, part number, Julian date the item was removed and the time/cycle.

(b) Blocks G08 thru G38 - Installed/New Item- Enter the manufacturers code, component serial number, if the change resulted in part number change, enter the new part number. The time cycle will remain the same.

(15) Block B08 - Received - Enter the Julian date the shop received the TDC.

(16) Block B12 - Time - Enter the time the shop received the TDC.

(17) Block B19 - In Work - Enter the Julian date the shop starts work on the TDC.

(18) Block B23 - Time - Enter the time the shop started to work on the TDC.

(19) Block B30 - Completed - Enter the Julian date the TDC was completed.

(20) Block B34 - Time - Enter the time that the TDC was completed.

(21) Blocks B16 and B27 are left blank.

(22) Failed/Required Material - This section provides the complete record of ordering, follow-up actions, and delivery status of the material and/or kits required to incorporate the TDC.

(23) Discrepancy Block - Enter any information that will aid in planning or accomplishment of the TDC.

(24) Corrective Action Block - Enter a brief description of the action taken to perform the TDC.

(25) Inspected By, Corrected By, Supervisor Blocks - Enter information as required.

2. Monthly Close Out and Re-initiation Procedures.

a. Close Out - All SCIR related maintenance actions, except those involving troubleshooting, must be closed out on the last day of the month. Close out is not required for maintenance actions that have not impacted aircraft capability, i.e. maintenance actions with no EOC codes documented or those with an "A" documented. Close out is accomplished by using the existing VIDS/MAF completed line as 2400 on the last day of the month. Transaction Code 11, Action Taken "N", and Items Processed "0" will be used for all maintenance actions except control documents for inspection, which will be closed out using an Action Taken of "O". Document as much of the work unit code as known at the time of the close out.

b. Re-initiation - Documentation of a maintenance action that has been closed out is continued by initiating a new VIDS/MAF. On the re-initiated VIDS/MAF, the following information will be transferred from the closed out VIDS/MAF:

(1) H-Z - Failed/Required Material.

(2) Block A19 - Work Center.

(3) Block A22 - Work Unit Code.

(4) Block A29 - Action Organization.

(5) Block A34 - Maintenance Level.

(6) Block A48 - Type Equipment Code.

(7) Block A52 - Bureau/Serial Number.

(8) Block A58 - When Discovered (Blank).

(9) Block A59 - Type Maintenance (Blank).

(10) Block A65 - Safety/EI Serial.

(11) Blocks A08 thru A14 - Job Control Number.

(12) Turn In Document Number.

(13) Blocks E08 thru E52 - Removed/Old Item.

(14) Blocks F08 thru F19 - Technical Directive Identification.

(15) Discrepancy.

(16) Received Line - Enter the next Julian date after the close out date and "0001" in the time block. In the EOC code column, enter the EOC code in effect.

(17) Closed Out in Maintenance - Leave the In Work, Completed and Maintenance/Supply Record section open to document the SCIR situations that occur as the maintenance action progresses.

(18) Closed Out in Supply - Duplicate the date, time and EOC code from the received line in the In Work line and the top line of the Maintenance /Supply Record section. Enter an "$" in the first job status block (B53) of the completed line and leave succeeding lines of the Maintenance/Supply Record section open to document the SCIR situations that occur as the maintenance action progresses.

J. SUMMARY: This lesson has shown you how to document TDVIDS/MAFS and the procedures to follow to perform monthly close out and re-initiation of the TD VIDS/MAFs. Accurate documentation of data is necessary to identify both the compliance of and all direct man-hours expended in performance of the directive.

K. QUESTIONS AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-06

SUBSYSTEM CAPABILITY AND IMPACT REPORTING (SCIR)

A. LECTURE NUMBER: G-06

B. TIME: 1 Hour

C. DATE PREPARED: 1 November 1989

D. DATE REVIEWED: 7 February 1997

E. TITLE: SUBSYSTEM CAPABILITY AND IMPACT REPORTING (SCIR)

F. OBJECTIVE: To familiarize personnel with the Subsystem Capability and Impact Reporting (SCIR) program.

G. INSTRUCTIONAL AIDS:

1. VIDS/MAF

H. REFERENCES:

1. OPNAVINST 4790.2

2. OPNAVINST 5442.4M

I. PRESENTATION: The SCIR system is used to monitor mission capability of aircraft. (SCIR will be documented on the VIDS/MAF when a discrepancy or a maintenance action causes a reduction of the equipment mission capability). This system provides managers with the degree of mission impairment, the system/subsystem that caused mission impairment, and maintenance/ supply impact on aircraft capability.

1. Subsystem Capability and Impact Reporting (SCIR).

    a. SCIR is applicable to all on-equipment work on end items having a MESM and is documented by the work center performing the maintenance action whenever the end item capability is impacted.

        (1) SCIR is applicable when:

            (a) Repairing an aircraft discrepancy.

            (b) Inspecting an aircraft discrepancy.

            (c) Installing a TDC in an aircraft.

    b. Reference (b) contains the MESM for each type/model aircraft. All applicable Equipment Operational

Capability (EOC) codes are listed, along with their associated equipment on the aircraft. If one of the systems is non-functional on an aircraft, then the associated EOC code must be documented on the VIDS/MAF for that discrepancy.

(1) It is only when an EOC is documented on a VIDS/MAF that the SCIR system is "turned on" to document mission capability of that equipment.

(2) Not currently impacting capability, A, is a special code recorded in the EOC code blocks to indicate that the maintenance action being performed does not currently impair the end item's mission capability; however, at some point in time during the maintenance action, equipment capability is impacted.

c. Data Groups - SCIR data is entered in blocks B08 thru D17 of the VIDS/MAF. These blocks are divided into three sections:

(1) Repair cycle - B08 thru B34

(2) Awaiting Maintenance - B38 thru B49

(3) Maintenance/Supply Record - B53 thru D17

d. Definitions of common terms.

(1) Elapsed Maintenance Time (EMT) is clock time spent actually working on the aircraft and is always documented as maintenance time, even though parts may be on order from supply.

(2) Maintenance time is the sum of Awaiting Maintenance (AWM) and EMT.

(3) Awaiting parts (AWP) is the same as supply time. AWP is that time when no work can be performed on the end item because parts are on order from supply. Parts are not considered to be ordered until the demand has been forwarded to the supply department.

(4) SCIR gripe life is the total length of time a discrepancy is SCIR related. SCIR gripe life = AWP + EMT + AWM.

(5) Computer generated AWM (AWM "O") - Using the SCIR gripe life formula, the computer will account for every hour of gripe life. Time which has not been accounted for as AWP, EMT or documented AWM will be categorized as AWM and assigned a reason code of "O". AWM "O" will never be documented on the VIDS/MAF.

e. Repair cycle documentation.

(1) Received line - Enter the Julian date and time the maintenance action was reported. In the EOC block, B16, enter the EOC code that best describes the current mission capability of the aircraft. "Received" is automatically considered to be in a maintenance status.

(2) In Work line - Enter the Julian date and timework was begun and the EOC code that best describes the mission capability when work started. "In Work" is automatically considered to be in a maintenance status.

(3) Completed line - Enter the Julian date and time the maintenance action was completed. This date and time must be equal to or greater than the latest date and time entered in the repair cycle or maintenance/supply record sections.

f. Maintenance/Supply Record Documentation.

(1) This section is used to keep track of changes in job status between maintenance and supply, and changes in EOC codes that occur during a maintenance action.

(a) Job Status column - Enter "S" (supply) when maintenance is halted due to AWP. Enter "M" (maintenance) to indicate the end of AWP status or a change in EOC code.

(b) Date/Time/EOC columns - Enter the date, time and applicable EOC code as job status changes.

NOTE:
THE JULIAN DATE AND TIME ON THE TIP LINE OF THE MAINTENANCE/SUPPLY RECORD SECTIONS MUST BE EQUAL TO OR GREATER THAN THE DATE AND TIME ON THE IN WORK LINE OF THE REPAIR CYCLE SECTION. THE DATE AND TIME ON SUCCEEDING LINES MUST BE EQUAL TO, OR LATER THAN THE DATE AND TIME ON THE LINE DIRECTLY ABOVE.

g. Awaiting Maintenance Documentation.

(1) This section is used to record AWM hours and reason codes of the three most significant AWM situations documented in the accumulated AWM hour's block in the right hand corner of the VIDS/MAF. Order of significance may be determined by local policy.

NOTE:
AWM TIME IS NOT ACCUMULATED ON MAINTENANCE ACTIONS WHEN SCIR IS NOT DOCUMENTED IN THE EOC CODE BLOCKS OF THE REPAIR CYCLE AND MAINTENANCE/SUPPLY RECORD SECTIONS.

2. Monthly Close Out and Re-initiation Procedures

a. Close out - all SCIR related maintenance actions, except those involving troubleshooting, must be closed out on the last day of the month. Close out is not required for maintenance actions that have not impacted aircraft capability, i.e. maintenance actions with no EOC codes documented or those with an "A" documented only. Close out is accomplished by using the existing VIDS/MAF completed line as 2400 on the last day of the month. Transaction Code 11, Action Taken "N", and Items Processed "O" will be used for all maintenance actions except control documents for inspection, which will be closed out using an Action Taken of "O" and for SCIR impacted TD compliance use TD Status Code "W" with Transaction Code 41. Document as much of the work unit code as known at the time of the close out. Any SCIR related maintenance actions with valid EOC code hours must be closed out at the end of the

current reporting period even though they are EOC coded "A" at the end of the period. At the time of closeout, re-initiation of all SCIR related maintenance actions would be necessary for the forthcoming period using EOC Code "A".

b. Re-initiation - Documentation of a maintenance action that has been closed out is continued by initiating a new VIDS/MAF in accordance with reference (a).

J. SUMMARY: The purpose of this lesson guide is to give all Marines a basic working knowledge of the Subsystem Capability Impact Reporting (SCIR) System and its documentation on the VIDS/MAF.

K. QUESTIONS AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-07

LINE MAINTENANCE SAFETY PROCEDURES

A. LECTURE NUMBER: G-07

B. TIME: 1 Hour

C. DATE PREPARED: 1 November 1989

D. DATE REVIEWED: 7 February 1997

E. TITLE: LINE MAINTENANCE SAFETY PROCEDURES

F. OBJECTIVE: To familiarize personnel with proper procedures and safety practices on the flight line.

G. INSTRUCTIONAL AIDS:

1. Assigned Aircraft
2. Fire Extinguishers

H. REFERENCES:

1. OPNAVINST 4790.2_
2. Applicable Aircraft MIMs/MRCs/Mis
3. NA-00-80T-96

I. PRESENTATION: Safety in any environment is important. The need to know procedures and policies is paramount to an effective maintenance program. The flight line is a high risk area, demanding alertness and strict adherence to procedure. Our efforts to ensure proper/safe practices are never ending. With the modernization of aircraft systems and support equipment, training in the safety arena is constantly growing. Personnel must have a greater understanding of their role in the effort to increase safety and decrease the occurrence of mishap/accidents in all facets of maintenance.

1. Flight line Safety:

    a. All personnel going onto the flight line shall wear appropriate personal protective equipment.

    b. Personnel performing maintenance on aircraft will ensure all tasks are coordinated through Maintenance Control, to identify possible unsafe conditions when

multiple work centers are on the aircraft. Personnel shall observe all aircraft safety requirements as follows:

(1) Ensure aircraft is grounded, as applicable.

(2) Ensure appropriate safe guard measures have been taken if aircraft are loaded with ammunition or explosives.

(3) Ensure appropriate safe guard measures have been taken, if aircraft are equipped with or utilized with lasers.

(4) Ensure appropriate safety devices are installed where applicable.

(5) Ensure cockpit check is performed prior to applying ground power.

(6) Ensure all seat and canopy devices are safe prior to cockpit entry. Only properly certified personnel may enter cockpit.

(7) When servicing aircraft ensure all checklists and maintenance procedures are followed.

(8) Do not operate Support Equipment without proper certification and training.

(9) Wear all appropriate protective clothing and equipment as it applies to each maintenance task, (i.e., fuel cell maintenance).

(10) Do not go on flight line with loose items, (i.e., covers, coins, keys, etc.). Refer to applicable maintenance instructions.

(11) Ensure the appropriate TCP and FOD programs are adhered to.

(12) Ensure all fire bottles have seals intact, and are properly stowed in racks or are lying on their side. The inspection card is not required on the Flight Line.

(13) Use designated walkways on all aircraft. Do not take any unnecessary chances!

Use maintenance stands where applicable.

(14) Observe all aircraft support equipment caution markings i.e. NO STEP, NO PUSH, DANGER INTAKE, etc.

(15) Ensure that all chocks are in good condition. Faulty chocks could result in an accident or an engine becoming damaged by FOD.

(16) Ensure that all tools and clothing are free of oil and grease whenever personnel are working around liquid or gaseous oxygen.

(17) Ensure that "No Smoking" regulations are adhered to.

(18) Ensure that power is not applied, except for that which is essential, to an aircraft while it is being refueled/defueled.

(19) Ensure that the fuel/defuel truck is parked in a manner that would allow for it's quick removal in case of an emergency.

(20) Ensure that aircraft/support equipment are properly grounded before fueling/defueling begins.

(21) Aircraft will never be fueled/defueled in a hangar.

(22) Be aware of your surroundings!

(23) Remove as soon as possible any fluids spilled on the deck.

(24) All aircraft/support equipment shall be chocked and chained IAW appropriate manuals.

(25) Use caution in the vicinity of operating intakes, rotor blades, propellers, and engine exhaust while aircraft engines are operating.

(26) Exercise caution and maintain proper clearance when the auxiliary power and air turbine starter units are operating.

(27) Be alert when going under an operating aircraft. Ensure that there is a Plane Captain or safety observer who has knowledge of your intentions while under the aircraft. There are many movable control surfaces that could cause serious bodily harm or death if activated at the wrong moment. Proper headgear shall be utilized at all times (CRANIAL STYLE HELMET) as per local maintenance instructions.

(28) Always remove electrical power cable from aircraft when not in use. Ensure power unit is cut off prior to disconnecting electrical power. If possible keep power cable off ground to prevent water intrusion. Ensure power cables are restored in their proper place after the completion of task.

(29) All surface movement of aircraft shall be performed by qualified personnel and IAW with reference (c), and Local Maintenance Instructions.

(30) Be aware of hazards created due to weather conditions, (i.e. icing, thunderstorms, high winds, etc.)

2. Fire fighting procedures and precautions:

a. The phone number for crash crew shall be available to all personnel in case of an emergency.

b. With the introduction of HALON 1211 fire extinguishers, all classes of fire can be extinguished with this agent.

WARNING!
SPECIAL CARE SHOULD BE TAKEN WHILE USING HALON 1211 DUE TO THE POTENTIAL OF DEATH.

c. Proper classes by qualified personnel should be given to all personnel on how to properly handle and contain a fire.

d. Do not try to contain a fire by yourself, always seek help and give the alarm.

J. SUMMARY: Aircraft maintenance and safety are paramount when working on the flight line. The importance of safety and using proper maintenance procedure cannot be over emphasized. Personnel working close to operating aircraft always have a potential risk of injury, however if procedures are followed incidents involving injury can be reduced dramatically. The prevention of accidents starts with awareness and alertness whenever you are on the flight line. Ensuring safe flight line operation should be an all hands effort.

K. QUESTIONS AND ANSWER PERIOD:

NOTE:
REFER TO LOCAL MI FOR ADDITIONAL AND SPECIFIC INFORMATION.

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-08

HYDRAULIC CONTAMINATION CONTROL PROGRAM

A. LECTURE NUMBER: G-08

B. TIME: 1 Hour

C. DATE PREPARED: 1 November 1989

D. DATE REVIEWED: 7 February1 997

E. TITLE: HYDRAULIC CONTAMINATION CONTROL PROGRAM

F. OBJECTIVE: To familiarize personnel with the Hydraulic Contamination Control Program, sources and effects of hydraulic contamination, and hydraulic fluid sampling procedures.

G. INSTRUCTIONAL AIDS:

1. Contamination Analysis Kit.
2. Videotape number 802577DN (as available)/4B38A slide show.
3. One piece of hydraulic support equipment (as available).
4. Utilize NAVAIR 01-1A-17 (as applicable).

H. REFERENCES:

1. OPNAVINST 4790.2
2. NAVAIR 01-1A-17
3. NAVAIR 17-15E-52
4. OPNAVINST 5700-23B
5. NA A1-NAOSH-SAF-000/P5100

I. PRESENTATION: The objective of the Hydraulic Contamination Control Program is to achieve and maintain a satisfactory level of fluid purity in hydraulic systems, thereby providing for safe and efficient operation of aircraft and Support Equipment (SE). Hydraulic fluid contamination is defined as the presence of undesirable foreign matter that may or may not be visible to the naked eye and is capable of adversely affecting system performance or reliability.

Undetected and uncontrolled contamination in an SE hydraulic system poses a serious threat to supported aircraft systems.

1. Responsibilities within the Hydraulic Contamination Control Program:

    a. Program Monitor

        (1) Perform audits, to ensure responsible work centers are complying with all existing Hydraulic Contamination Control program directives.

NOTE:
INSTRUCTOR MAY, AT ANY TIME UTILIZE THE NAMPSOP, TO ENSURE THE INFORMATION REQUIRED BY THE ASSIGNED RESPONSIBILITIES AND PROCEDURES ARE FULLY COVERED.

        (2) Supervise the sampling and analysis of any hydraulic system suspected of contamination.

        (3) Develop and use contamination control sequence charts.

        (4) Develop an open book test to be administered by Quality Assurance, which will be required to be viewed annually.

        (5) Ensure suspected contamination is reported immediately to maintenance/production control and QA supervisors. Will ensure work center personnel receive "hands on" technical training on taking and analyzing hydraulic samples using a hydraulic contamination analysis kit, (IAW references (b) and (c).

NOTE:
IF AN UNUSUAL CONDITION OCCURS AS CITED IN REFERENCE (b), SECTION V, HYDRAULIC SYSTEMS WILL BE SAMPLED AND ANALYZED UNDER THE SUPERVISION OF QA. (INSTRUCTOR SHOULD BRIEFLY GO OVER THESE CONDITIONS.)

(6) Observe sampling and analysis techniques during work center audits.

(7) Assess work center's assigned spaces for cleanliness, safety precautions, SE upkeep/abuse, facility adequacy, usability of authorized materials, and compliance with applicable hydraulic maintenance technical data.

(8) Will ensure work centers use appropriate methods to prevent contamination from entering hydraulic systems opened for maintenance. Only approved closures listed in reference (b) will be used to protect fluid system/components being returned to supply.

(9) Will ensure hydraulic fluid analysis kits are checked on a scheduled basis to ensure the material condition, contents, and cleanliness of kits are maintained.

(10) Will ensure only authorized fluid dispensing equipment is used and such equipment is maintained to a high standard of cleanliness. All servicing equipment will be equipped with 3-micron (absolute) filtration.

b. Hydraulic Contamination Control Program Manager Work.

(1) Ensure compliance with hydraulic systems contamination control requirements and procedures located in references (a), (b), and (d), applicable MIMs, and MRCs.

(2) Provide indoctrination training to all personnel that will be required to perform maintenance on aircraft hydraulic systems/components, SE hydraulic systems/components.

(3) Ensure an adequate number of qualified hydraulic contamination control personnel are assigned.

(4) Maintain a high standard of housekeeping where hydraulic maintenance/sampling is performed.

(5) Ensure that fittings or components are capped/plugged immediately, using only approved closures whenever aircraft/SE hydraulic systems integrity is broken.

(6) Ensure hydraulic fluid patch tests are performed and submitted IAW references (a), (b), and (d).

(7) Maintain hydraulic fluid trend analysis chart(s)/graph(s) for each of the activities assigned aircraft/SE.

NOTE:
ENSURE THAT WHEN RECEIVING A PIECE OF HYDRAULIC SUPPORT EQUIPMENT, THE TREND ANALYSIS CHARTS ARE ALSO RECEIVED.

(8) Maintain the hydraulic sound slide program, number 4B38A or videotape number 802577DN for training purposes.

c. Maintenance/Production Control.

(1) Ensure hydraulic samples are obtained and analyzed prior to transfer/acceptance of Aircraft/SE.

(2) Ensure appropriate Aircraft logbook and SE Miscellaneous History section entries are made for failed samples.

(3) Ensure trend analysis chart(s)/graph(s) for aircraft are included in logbooks upon transfer of aircraft.

d. Individual Responsibilities.

(1) Every technician must be aware of the causes and effects of hydraulic contamination.

(2) Every technician must be aware of the practices and procedures to prevent contamination.

NOTE:
INSTRUCTOR SHOULD, AFTER READING THE INDIVIDUAL RESPONSIBILITIES, ENSURE THAT PERSONNEL UNDERSTAND THAT PARAGRAPHS 1, 2, 3, 4, 5, 7, 8, 9 AND 10, FROM QA RESPONSIBILITIES, ALL DEAL DIRECTLY WITH THEM AND SHOULD RE-EMPHASIZE THEIR IMPORTANCE.

(3) All personnel must be aware of safety precautions for all HAZMAT/HAZWASTE used/ produced. Proper PPE is required while using or disposing of these materials. Reference (d) and (e) give guidance.

2. Sources and effects of contamination.

a. Particulate contamination sources:

(1) Organic Contamination. Organic solids or semi-solids found in hydraulic systems are produced by wear, oxidation or polymerization (the combining of two or more small molecules to form larger molecules). Due to wear or chemical reactions, minute particles of O-rings, seals, gaskets, and hoses are present in hydraulic systems. Synthetic products, such as neoprene, Thiokol, silicones, and hypalon, which are resistant to chemical reaction with hydraulic fluid, produce small wear particles also. The ability of a hydraulic fluid to resist oxidation or polymerization in service is defined as it's oxidation stability. Oxidation of hydraulic fluids increases with pressure and temperature. Oxidation products appear as organic acids, asphatics, gums, and varnishes. These products combine with particles in the hydraulic fluid to form sludge. Some oxidation products are oil soluble and cause the hydraulic fluid to increase in viscosity while others are not oil soluble and form sediment.

(2) Metallic solid contamination. Metallic contaminants are almost always present in a hydraulic system and will range in size from

microscopic particles to particles readily visible to the naked eye. These particles are the result of wearing and scoring of bare metal parts and plating materials such as silver and chromium. These wear products and other foreign metal particles, such as steel, aluminum, and copper, may also act as a metallic catalyst in the formation of oxidation products. The major metallic materials found in hydraulic fluids are ferrous, aluminum, and chromium particles. Because of their continuous high-speed internal movement, hydraulic pumps usually contribute most of the metallic particulate contamination. Metal particles are also produced by hydraulic valves, actuators, etc. due to body wear and the chipping and wearing away of small pieces of metal plating materials.

(3) Inorganic solid contamination. This group of contaminants includes dust, dirt, paint particles, and silicates. Glass particles, from glass bead peening and blasting, may also be found as contaminants. Glass particles are very undesirable contaminants due to their abrasive effect on synthetic rubber seals and the very fine surfaces of critical moving parts. Inorganic contaminants enter hydraulic systems through use and during maintenance. It is important that all exposed fluid ports be sealed with approved protective closures to minimize such contamination.

NOTE:
IF HE/SHE HAS NOT ALREADY DONE SO, THE INSTRUCTOR SHOULD GO OVER THOSE APPROVED PROTECTIVE CLOSURES LISTED IN REFERENCE (b).

b. Particulate contamination effects:

(1) Particulate matter is one of the principal causes of wear in hydraulic pumps, actuators, valves, and servo valves. Even small amounts of contamination will accelerate the amount of

wear on spool-type electro hydraulic valves. Erosion of the sharp spool edges and general deterioration of the surfaces of the spools is increased by contamination. The extremely close fit of spools in servo-valve housings makes these valves particularly susceptible to damage or erratic operation when operated with contaminated hydraulic fluid.

(2) Hydraulic actuators and valves are affected by contamination in several ways. Large metallic or hard nonmetallic particles will collect at the seal area, and the scraping action of these particles may groove the inside wall of the actuator body. Small particles act as abrasives between seals and actuator body and cause general wear and scoring. The resultant wear and scoring will eventually cause excessive fluid leakage and possible seal failure due to extrusion of the seal into the enlarged gap between the piston head and the bore of the actuator body. Once the abrasive material begins to wear the actuator body, the process will continue at an increasing rate because the wear particles add to the available abrasive material. In a similar manner, metallic or nonmetallic particles may lodge in the poppet and poppet seat portions of valves and thereby cause system malfunction by holding valves open. Oil oxidation products are not abrasive, but they will result in system degradation because the resulting sludge or varnish-like materials will collect at the close-fitting moving parts, such as spool and sleeve on servo valves, causing sluggish valve response.

c. Fluid contamination.

(1) Air contamination sources.

(a) Hydraulic fluids are adversely affected by dissolved, drawn in, or free air. Air may be introduced through improper maintenance or as a result of system design. Any maintenance operation that involves breaking into the hydraulic system, such

as disconnecting or removing a line or component, will invariably result in some air being introduced into the system. This source of air can, and must, be minimized by pre-filling replacement components with new, filtered fluid prior to installation. A good example of how air can be introduced into a system would be the failure to pre-fill a filter element bowl prior to installation.

NOTE:
INSTRUCTOR CAN FURTHER EXPAND ON THIS IDEA BY USING OTHER COMMON COMPONENTS, ETC., AS EXAMPLES.

(b) Most aircraft hydraulic systems have "built-in" sources of air. Leaky seals in gas-pressurized accumulators and reservoirs can feed gas into a system faster than it can be removed, even with the best maintenance.

(c) Another lesser-known but major source of air contamination is air that is sucked into the system past actuator piston rod seals. This usually occurs when the piston rod is stroked by some external means while the actuator itself is not pressurized. Moving a flight control surface by hand, or operating flight controls having tandem actuators with only one system pressurized, can produce a negative pressure in the non-powered actuator that will result in air being pulled past the seals.

(d) Improperly used Support Equipment is another major source of air contamination. An improperly used fill/service unit or portable hydraulic test stand can introduce large amounts of air into a system. It is extremely important that hydraulic Support Equipment and their service hoses be properly de-aerated (have

all air removed) prior to aircraft connection.

(2) Air contamination effects.

(a) Free or entrained air affects the hydraulic system in many ways. If the fluid supplied to a pump has high air content, resulting cavitations can cause severe mechanical damage within the pump and partial or complete loss of output pressure. A temporary pressure loss, in many of our present systems because of the resulting loss of "bootstrap" pressure, can prevent the pump from re-priming itself.

(b) Air elsewhere in the system generally manifests itself in the form of slow or erratic actuator movement. Sometimes vibrations that maybe felt and/or heard accompany this.

(c) Air can also damage a system in less obvious ways. Air entrained in the fluid has been shown to cause erosion of metering orifices and servo valves as well as high fluid temperatures. High temperatures can result in fluid breakdown as well as the hardening of seals and attendant leaks.

(3) Water contamination.

(a) Water is a serious contaminant of hydraulic systems. Hydraulic fluids are adversely affected by dissolved, emulsified, or free water. Water may result in the formation of ice or oxidation products, and in the corrosion of metallic surfaces. Water may also be condensed from air entering vented systems. When it separates from hydraulic fluids, it collects in filter bowls and other more critical locations. Corrective actions shall be taken to remove all free

or emulsified water from hydraulic systems.

(4) Water contamination effects.

(a) The presence of water in hydraulic systems can result in the formation of undesired oxidation products and corrosion of metallic surfaces. If water in the system results in the formation of ice, fluid flow, or operation of valves, actuators or other moving parts will be impeded. This is particularly true of water located in static circuits or system extremities and subjected to high-altitude, low temperature conditions. Microorganisms may grow and spread in hydraulic fluid contaminated with water. These may clog filters and be detrimental to hydraulic system performance.

(5) Solvent contamination.

(a) Solvent contamination is a special form of foreign fluid contamination in which the original contaminating substance is a chlorinated solvent. Chlorinated solvents or their residues may, when introduced into a hydraulic system, react with any water present to form highly corrosive acids. Solvent contamination is extremely difficult to arrest once it occurs and must be prevented by proper selection of cleaning agents when performing hydraulic system maintenance.

(6) Solvent contamination effects.

(a) Chlorinated solvents, when allowed to combine with the minute amounts of water often found in an operating hydraulic system, will hydrolyze to form hydrochloric acids. These acids will attack internal metallic surfaces in the system, particularly those that are ferrous, and produce a severe rust-like corrosion. Such corrosion is virtually

impossible to arrest, and extensive component overhaul and system decontamination is generally required to restore the system to operational condition.

(7) Foreign fluids contamination.

(a) Hydraulic systems can be seriously contaminated by foreign fluids other than water and chlorinated solvents. This type of contamination, although rare, is generally a result of lube oil, engine fuel, or incorrect hydraulic fluid having been introduced inadvertently into the system during servicing. In addition, some models of aircraft employ hydraulic oil coolers which, when leaky, can result in fuel intrusion into the hydraulic system.

(b) Contamination with a foreign fluid, when suspected, can usually be verified by chemical analysis of a fluid sample. Assistance of a cognizant Engineering Activity must be requested to verify and identify the contaminant and to direct the required decontamination.

3. Hydraulic fluid sampling procedures. (Applicable work centers)

a. When sampling reveals Navy standard class five contamination is exceeded, or evidence of water, chlorinated solvent, or any other form of contamination, requiring decontamination in accordance with NA 01-1A-17 (NOTAL), an entry shall be made in the miscellaneous/history section of the aircraft logbook. In addition, upon receipt and transfer of the aircraft to and from standard depot level maintenance, or from one reporting custodian to another, hydraulic system sampling shall be performed and the results entered in the miscellaneous/history section of the aircraft logbook. If unusual conditions occur, hydraulic systems will be sampled and analyzed under the supervision of Quality Assurance.

NOTE:
INSTRUCTOR MAY REFER TO SECTION X IN REFERENCE (b) FORADDITIONAL INFORMATION ON SOLVENT CONTAMINATION.

b. Work center personnel receive "hands on" technical training in obtaining and analyzing hydraulic samples using a contamination analysis kit.

NOTE:
INSTRUCTOR WILL DEMONSTRATE THE PROPER PROCEDURES FOR CONDUCTING A PATCH TEST IN ACCORDANCE WITH REFERENCE (c), TO INCLUDE ALL SAFETY PRECAUTIONS.

c. Sampling and analysis techniques will be observed periodically as well as during work center audits.

d. Work centers will use appropriate methods to prevent contamination from being introduced into hydraulic systems that have been opened for maintenance.

e. The hydraulic fluid analysis kit will be checked on a scheduled basis to ensure the material condition, content, and cleanliness of the kit is maintained.

J. SUMMARY: The objective of the Hydraulic Contamination Program is to achieve and maintain a satisfactory level of fluid purity in hydraulic systems, thereby providing for safe and efficient operation of aircraft and Support Equipment. Control of contamination is therefore a must and all methods of detection and control should be used in accomplishing this objective.

K. QUESTIONS AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-09

SUPPORT EQUIPMENT (SE) MISUSE/ABUSE PROGRAM

A. LECTURE NUMBER: G-09

B. TIME: 1 Hour

C. DATE PREPARED: 1 July 1991

D. DATE REVIEWED: 7 February 1997

E. TITLE: SUPPORT EQUIPMENT (SE) MISUSE/ABUSE PROGRAM

F. OBJECTIVE: To inform all maintenance personnel the need of constant awareness of unnecessary misuse and abuse of SE by utilizing local MI's and senior Inst. that applies to this program.

G. INSTRUCTIONAL AIDS:

1. Sample copy of an OPNAV 4790/108 Support Equipment Misuse/Abuse Form.

2. Applicable Local Squadron Instruction(s).

H. REFERENCE:

1. OPNAVINST 4790.2_

2. NA 00-80T-96

3. TYCOM INSTRUCTIONS

I. PRESENTATION: The SE Misuse/Abuse Program emphasizes and familiarizes all personnel with responsibility of reporting SE misuse/abuse. All personnel are charged with the responsibility of conducting safe and proper operation of SE while performing maintenance actions. Personal safety and equipment operational effectiveness cannot be overemphasized while performing maintenance utilizing SE. Improper use of SE has resulted in excessive ground handling mishaps, equipment damage, personal injuries and even death and can greatly reduce the capability and operational readiness of any unit. In this time of reduced budgets, the added SE maintenance costs created by SE Misuse/Abuse is intolerable.

1. RESPONSIBILITIES:

   a. All personnel have the responsibility of reporting SE misuse/abuse. Anyone witnessing SE misuse/abuse may submit an OPNAV 4790/108, Support Equipment Misuse/Abuse Form, to the Quality Assurance Division. The Quality Assurance Division will be responsible for the management of the SE misuse/abuse program.

   b. Work Center Supervisors will be responsible for ensuring that all personnel issued SE licenses are familiar with equipment operating procedures and aware of the value and importance of SE to the support of squadron operations utilizing reference (b).

   c. Quality Assurance, IAW reference (a), will be responsible for the following:

      (1) Serialize the SE Misuse/Abuse report.

      (2) Maintain a logbook for all reports issued. (Example: Report serial numbers could commence with 0001 at the beginning of each calendar year and progress consecutively throughout the year.)

      (3) Maintain a file for all pending and completed Misuse/Abuse reports.

      (4) Forward, for appropriate action, a copy of the Misuse/Abuse report to the Commanding Officer of the command to which the offender is attached and/or to the Commanding Officer of the command which held custody of the item where the misuse/abuse occurred.

      (5) Conduct investigation and submit recommendation for corrective action with all Misuse/Abuse reports. An analysis of licensing, training/ certification, maintenance procedures, safety and related trends will be conducted during this investigation.

(6) Initiate follow-up reports when Misuse/Abuse reports are not returned with corrective action within ten (10) working days of issue.

(7) Ensure copy of Misuse/Abuse report is sent to the originator.

(8) The combined reports will then be forwarded through the chain of responsibility to the Commanding Officer of the ship, station or Marine Aircraft Group (MAG).

2. SUPPORT EQUIPMENT (SE) MISUSE/ABUSE REPORTING PROCEDURES:

a. Any personnel witnessing SE misuse/abuse may submit an OPNAV 4790/108 SE Misuse/Abuse Form to QA. A copy of the report will be retained by the division of the individual originating the report. The report shall be forwarded to the organization having individual material readiness list (IMRL) reporting responsibility for the SE item. A copy of the report will also be forwarded, for appropriate action, to the CO of the command to which the offender is attached/the CO of the command, which held custody of the item where the misuse/abuse occurred. As a minimum, an investigation will be conducted by QA/A of the command receiving the report, and an analysis performed to provide appropriate recommendations for corrective action. Reports will be returned for further investigation, within 10 working days, to the command having the IMRL reporting responsibility. A copy of the report will also be sent to the originator. During the investigation, an analysis of licensing, training/ certification, maintenance procedures, safety, and related trends will be conducted. The combined reports will then be forwarded through the chain of command to the CO of the ship, station, or MARINE AIRCRAFT GROUP.

3. REVOKING SUPPORT EQUIPMENT LICENSES:

a. Commanding Officers have the responsibility to revoke an SE operator's license when;

(1) An individual displays unsafe operator habits, or displays behavioral traits that would constitute unsafe or abusive use of SE.

(2) For any reason the individual's U.S. Government Motor Vehicle Operator's Identification Card (OF-346) or state driver's license becomes invalid. (This applies to self-propelled equipment only.)

(3) An individual intentionally misuses or abuses support equipment.

(4) For any other reason deemed appropriate.

b. Once an individual's license is revoked, he/she must pass the written and practical tests required for a first time licensee to re-qualify.

J. SUMMARY: The complete understanding, by all maintenance personnel, of the purpose of the SE Misuse/Abuse Program will encourage proper use of SE in turn will greatly enhance the overall capability and operational readiness of any squadron or unit. Complete compliance, by all personnel, with the Support Equipment Misuse/Abuse Program, especially the responsibilities and reporting procedures, will ensure the safe, proper and most effective use of SE.

K. QUESTIONS AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-10

FOREIGN OBJECT DAMAGE (FOD) PREVENTION PROGRAM.

A. LECTURE NUMBER: G-10

B. TIME: 1 Hour

C. DATE PREPARED: 1 July 1991

D. DATE REVIEWED: 7 February 1997

E. TITLE: FOREIGN OBJECT DAMAGE (FOD) PREVENTION PROGRAM

F. OBJECTIVE: To familiarize personnel with the FOD Prevention Program, methods of prevention and FOD prone areas.

G. INSTRUCTIONAL AIDS:

1. Squadron Aircraft.

2. Applicable directives.

H. REFERENCE:

1. OPNAVINST 4790.2_.

2. Local Instructions.

I. PRESENTATION: FOD is any material, object or debris not an integral part of a system or its components. FOD Prevention is only effective if personnel are AWARE of its importance and the need to ensure that each task performed is followed by an inspection and inventory of all tools, fasteners and equipment used on the task. An effective FOD program can only be accomplished through an "ALL HANDS" effort. All maintenance programs include safety as a major concern; however, few have as great an impact on safety of personnel and equipment as the FOD program. Throughout Navy and Marine Corps Aviation, loss of aircraft, equipment and gas turbine engines is of major concern when costs of replacing these assets are high and increasing. Conservation of these assets can be accomplished through good housekeeping practices, proper maintenance procedures and adherence to program directives.

1. METHODS OF FOD PREVENTION:

    a. Good Housekeeping:

(1) Participate in command FOD walk downs.

(2) Keep shop spaces clean.

(3) Utilize proper receptacles for all waste, i.e. trash, FOD, etc.

(4) Ensure assigned HANGAR spaces are kept clean.

(5) Ensure FOD Prevention posters are appropriately displayed.

b. Adherence to Maintenance Procedures:

(1) Follow applicable directives on all assigned tasks.

(2) Ensure that proper inspection procedures are complied with on all assigned tasks.

(3) Use technical manuals for all aircraft and equipment maintenance.

(4) Don't cut corners. All procedures are established for your safety and the preservation of equipment and assets.

(5) Upon return to the work center, a sight inventory of the tool container will be conducted by the work center supervisor/Collateral Duty Inspector (CDI) and initials placed to the right of the tool container number on the VIDS/MAF.

(6) Follow established procedures for all consumable items. (Pre-Expended Bins (PEB))

(7) Ensure personnel are active in the Required Reading Program and participate in FOD indoctrination program. (Applicable Directives)

(8) Don't skip procedures to save time. Taking the extra time may save lives as well as assets

2. FOD PRONE AREAS AND RECOMMENDED PREVENTIVE METHODS:

a. Gas Turbine Engines.

(1) Intake Covers should always be used during periods of transport, preservation or aircraft in a non-flying status.

b. Flight Controls.

(1) Inspection behind all aircraft panels prior to closure of panels.

(2) Inspection of aircraft controls, cables, and mechanisms whenever maintenance is performed on/or in these areas.

c. Fuel and Hydraulic Systems.

(1) Proper fuel sampling procedures are followed to ensure contaminates do not enter aircraft or engine fuel systems.

(2) Proper hydraulic sampling is completed on all assigned equipment. (MICRO FOD as applicable)

(3) Spot check to see that open aircraft, engine, and component lines are covered with proper plugs or caps to prevent entrance of foreign objects.

d. Egress Systems.

(1) Ensure gas lines and cartridge surfaces are free of debris. Follow appropriate maintenance manuals. (As applicable to MOS)

e. Cockpits of Aircraft.

(1) Ensure cockpits are clean and free of debris. Inspect cockpits after any maintenance is performed.

(2) Perform personal inspections prior to entering areas of aircraft to eliminate FOD potentials such as pens, pencils, combs and other loose objects in pockets. Account for all items of personal clothing (i.e. gloves, watch cap, scarves, etc.)

f. Support Equipment.

(1) Keep all line maintenance and hangar support equipment free of Foreign Objects.

(2) Inspect support equipment chocks for serviceability, and loose parts.

g. Parking ramps, taxiways, and engine run-up areas.

(1) Check maintenance, storage and aircraft movement areas for cleanliness and deterioration of paving material.

NOTE:
INSTRUCTOR SHOULD EXPAND ON EACH AREA AS APPLICABLE TO TYPE AIRCRAFT OR SYSTEM. THIS DOES NOT COVER ALL PRONE AREAS, IT DOES GIVE A GOOD EXAMPLE OF TOPICS TO BE COVERED UNDER THE FOD PREVENTION PROGRAM.

J. SUMMARY: The FOD Prevention Program as you can see covers a broad spectrum of the everyday maintenance practices you employ. The emphasis of this program can be strengthened through AWARENESS and compliance with instructions. The key to a strong FOD Program is "YOU" the individual. Whether working on aircraft, equipment or in your shop spaces, remember that what you do may save equipment, aircraft and/or lives.

K. QUESTIONS AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-11

TOOL CONTROL PROGRAM (TCP)

A. LECTURE NUMBER: G-11

B. TIME: 1 Hour

C. DATE PREPARED: 3 July 1991

D. DATE REVIEWED: 7 February 1997

E. TITLE: TOOL CONTROL PROGRAM (TCP)

F. OBJECTIVE: To familiarize maintenance personnel with the responsibilities and procedures of managing an effective Tool Control Program.

G. INSTRUCTIONAL AIDS:

1. Tool Control Manual (TCM) for type aircraft.

2. Applicable TYCOM Instruction.

H. REFERENCE:

1. OPNAVINST 4790.2_.

2. NAVAIR 17-XXXXX-l (TCM) Aircraft Tool Control Manual Navy and Marine Corps.

3. TYCOM Instruction.

I. PRESENTATION: The primary objective of the Tool Control Program (TCP) is to enhance flight safety by eliminating aircraft accidents, mishaps and associated equipment damage attributable to missing or misplaced tools. Secondary objectives include reduction of expenditures for replacement of missing, defective, damaged, or pilfered tools, reduced man-hours for maintenance task completion, and a general improvement in the quality of aircraft maintenance.

1. TOOL CONTROL PROGRAM.

   a. Command:

      (1) Refer to the TYCOM instruction for all command responsibilities under the Tool Control Program.

b. Maintenance Officer (MO):

(1) Responsible for ensuring the monitoring of TCP.

c. Maintenance/Material Control/Production Control Officer:

(1) Coordinates the TCP and ensures that tools are procured and issued on a controlled basis.

d. Quality Assurance:

(1) Monitor and conduct work center audits of tool control procedures IAW ref. (a).

(2) Monitor defective tool reports and ensure poor quality tools are reported IAW reference (a).

(3) Brief field maintenance/contractor teams to ensure the unit tool control environment is maintained and that all tools are inventoried at the beginning and completion of maintenance.

(4) Conduct training for Collateral Duty Inspectors (CDI's) and Quality Assurance Representatives (QAR's) for the TCP.

e. Tool Control Program Coordinator (TCPC):

(1) The TCPC shall be directly responsible to the Maintenance/Material Officer for coordination and management of the units TCP.

(2) Maintain the Tool Control Center (TCC) as a centralized point for management and administrative coordination of the TCP.

(3) Procure and issue all replacement tools.

(4) Conduct monthly/quarterly inventories of all TCC’s and common/special tools and equipment.

(5) Survey all broken/defective tools.

f. Division Officer:

(1) Assign personnel to represent the division/work.

(2) Center for the TCP.

(3) Ensure formal Tool Control training is conducted.

g. Work Center Supervisor:

(1) Responsible for ensuring guidelines for Tool Control are followed IAW ref. (a) and TYCOM MI's.

(2) Prepare a billet description outlining Tool Control representative duties and responsibilities.

(3) Ensure TCC sight inventories are conducted. Refer to Paragraph 7.b. (Inventories and Documentation Procedures), of this instruction.

NOTE:
WHEN SOUND SUPPRESSERS, FACE SHIELDS, GOGGLES, LADDERS, AND OTHER SPECIAL TOOLS OR EQUIPMENT ARE REQUIRED IN THE PERFORMANCE OF AIRCRAFT/EQUIPMENT MAINTENANCE, SIGHT INVENTORY PROCEDURES LISTED ABOVE SHALL BE COMPLIED WITH. DOCUMENTATION ON THE VIDS/MAF IS NOT REQUIRED. HOWEVER, ALL PERSONNEL ARE RESPONSIBLE FOR ENSURING THAT SPECIAL TOOLS AND EQUIPMENT ARE NOT LOST OR MISPLACED.

(4) Ensure that all special containers developed by the work center, i.e., corrosion control kit, phased maintenance box, etc., are inventoried and controlled.

(5) Ensure that all tools/tool containers are properly constructed, identified, and marked IAW references (a) and (b).

h. CDI's:

(1) Assist the Work Center Supervisor to comply with the (TCP).

i. Maintenance Personnel:

(1) Upon task assignment, a sight inventory shall be conducted by the technician prior to the commencement of each task and all shortages shall be noted on the tool inventory. (As per reference (a)).

(2) Report all lost or missing tools immediately. (As appropriate with local instructions)

(3) Initiate a lost/missing tool report immediately. Report such missing tool (s) to his/her immediate supervisor.

(4) Inspect all work areas for tools and all other requirements that are required in the performance of the task. Ensure that no tool is unaccounted for in the toolbox or tool room, which may have been used during the maintenance action.

(5) When performing a maintenance task, each individual shall ensure that all tools are placed in the appropriate locations in the toolbox and that the toolbox is free of FOD prior to the CDI verifying the toolbox at a work stoppage or the completion of the task.

(6) Sign Visual Information Display System/ Maintenance Action Form (VIDS/MAF) only after verifying that all the tools are accounted for.

j. The flight engineer, crew chief, or senior assume those responsibilities of the work center supervisor applicable to the TCP for in-flight maintenance or maintenance performed on the aircraft at other than home station.

2. Container and Tool Marking:

   a. For ease of identification, all tool control containers and tools shall be marked to identify the Organization Code, Work Center Code, and Container Number. When more than one container of the same type is used, markings shall be extended to identify each container.

NOTE:
WHEN TOOL SIZE DOES NOT PERMIT ETCHING, THE FOLLOWING WARNING WILL BE AFFIXED TO THE CONTAINER: "CONTAINS TOOLS TOO SMALL TO MARK".

3. Tool Lists and Container Layouts: See appropriate TCM.

4. Care and Use of Hand Tools:

   a. All tools will be maintained in a clean condition free of oil/grease.

   b. All tools used on oxygen components will be segregated with the container marked "Oxygen Use only".

   c. For further information on Tool Care and Use, refer to appropriate Manufacturer's and/or Local Instructions.

5. Tool Issue and Receipt procedures:

   a. Hand tools special/common fall into two groups by task assignment, i.e., an eighty percent group or a twenty percent group. The eighty percent group consists of tools required to complete eighty percent of maintenance tasks, one hundred percent of the time. The twenty percent group consists of tools seldom used, which are individually checked out with tool tags, to supplement the eighty percent group. In addition to special/common hand tools the accountability of other tools, such as goggles, sound suppressers, cranial’s, aircraft washing equipment, etc., cannot be overstated.

(1) Checkout procedures for the eighty percent group are listed in local MI's.

(2) Tool Tags: Are used to check out the additional and/or twenty percent tools from the TCC or work center tool containers (shop boxes) when required.

6. Inventories and Documentation:

a. The TCP is based on the instant inventory concept. It provides internally configured, silhouetted, tool containers, i.e., all tools have individually highlighted locations. These highlighted locations provides for an instant inventory, which readily tell the maintenance personnel if a tool is missing.

(1) Inventory:

(a) A listing of individual items within the tool container. The inventory shall identify tool location by panel and item number. Individual tool location, within each container, shall be numbered to correspond to the inventory. When tool size does permit not etching, the inventory shall be annotated to draw special attention to those tools. A copy of the TCM is insufficient because it does not provide a place for comments/notes for tools that are missing or on order.

(2) Diagrams:

(a) Are drawings, which depict the location of all tools in the container? They are utilized in conjunction with the Inventory.

(3) Daily Inventory Sheet:

(a) A locally prepared form to document tool container inventories completed.

NOTE:
THOSE ACTIVITIES WITH NALCOMIS SHOULD REFER TO THE NALCOMIS USERS MANUAL FOR SPECIFIC DETAILS AND PROCEDURES FOR TOOL CONTROL.

b. Procedures:

(1) Upon task assignment, note the number of the tool container on the VIDS/MAF Copy 1 in the accumulated work hour's section. The technician shall do a sight inventory prior to starting each task and note all shortages. Every measure must be taken to ensure that missing tools do not become a cause of FOD. Inventories shall also be done before a shift change, when work stops, after maintenance has been completed, and before conducting an operational systems check on the equipment.

(2) After maintenance has been completed, and before an operational systems check on the equipment, the inspection process shall once more be performed.

(3) When all maintenance actions are completed, the work center supervisor signs VIDS/MAF Copies 1 and 5, signifying that maintenance has been completed and that all tools have been accounted for.

(4) If any tool is missing at any one of the above stages, an immediate search shall be conducted prior to reporting the work completed or signing off the VIDS/MAF. If the tool cannot be located, the MO or acting MO shall be immediately notified.

(5) If the tool cannot be located after the MO's directed search, the person doing the investigation shall personally sign a statement in the Corrective Action block of the VIDS/MAF that a lost tool investigation was conducted and the tool could not be found. Subsequently,

the normal VIDS/MAF completion process shall be followed.

NOTE:
FOR ADDITIONAL INVENTORY AND DOCUMENTATION PROCEDURES REFER TO LOCAL INSTRUCTIONS.

7. Broken/Defective Tools:

    a. Policy and documentation are handled at a Local Level refer to Local Instructions.

8. Lost/Missing Tools:

    a. Refer to Paragraph 7.b. (Inventories and Documentation Procedures), of this instruction.

9. Tool Replacement Procedures:

    a. Refer to Local Instructions and TCC supervisor and/or Material Control Officer.

J. SUMMARY: The effectiveness of any program relies directly on the perspective of the individuals that are responsible for it's implementation and use. The primary objective of a comprehensive Tool Control Program is to eliminate accidents and mishaps that are the result of lost or misplaced tools. Program success is an "All Hands" effort that hinges on collective attitudes and a positive approach toward compliance.

K. QUESTIONS AND ANSWERS PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-12

NAVAL AVIATION MAINTENANCE DISCREPANCY REPORTING PROGRAM (NAMDRP)

A. LECTURE NUMBER: G-12

B. TIME: 1 Hour

C. DATE PREPARED: 1 November 1989

D. DATE REVIEWED: 7 February 1997

E. TITLE: NAVAL AVIATION MAINTENANCE DISCREPANCY REPORTING PROGRAM (NAMDRP)

F. OBJECTIVE: To familiarize personnel with the identification and reporting procedures for deficiencies discovered in materials/publications, substandard workmanship, and improper quality assurance procedures and describe reporting criteria for submission of Aircraft Discrepancy Reports.

G. INSTRUCTIONAL AIDS:

1. Applicable MI's

H. REFERENCES:

1. OPNAVINST 4790.2_
2. OPNAVINST 5102.1
3. OPNAVINST 3750.6
4. OPNAVINST 8600.2

I. PRESENTATION: The Naval Aviation Maintenance Discrepancy Reporting Program (NAMDRP) is designed to provide prompt feedback and corrective action to preclude the reoccurrence of material failures, safety hazards, and deficient publications. Proper utilization of the NAMDRP is essential for accurate identification and initiation of corrective action. Safety is the primary concern of this program.

1. Naval Aviation Maintenance Discrepancy Reporting Program (NAMDRP).

    a. Responsibilities.

        (1) Quality Assurance.

(a) Manage the NAMDRP.

(b) Advise the Aircraft Maintenance Officer when the need for a NAMDRP report arises.

(c) Assist work centers in preparing the NAMDRP reports, ensuring that the reports are accurate, clear, concise, and comprehensive.

(d) Ensure NAMDRP reports are in the proper format and are submitted within the time frame established and are properly addressed/routed IAW reference (a).

(e) Ensure that all Engineering Investigation (EI)/Quality Deficiency Report (QDR) materials are properly handled, packaged, and marked prior to turn-in.

(f) Ensure follow-up of all outstanding NAMDRP reports.

(2) Aviation Safety Officer.

(a) Review all correspondence relating to aircraft, ground, flight, flight related, and explosive mishaps.

(3) Work Center Supervisor.

(a) Notify Quality Assurance to assist in verifying the validity of the discrepancy and determine whether and what type of report is required.

(b) Obtain a NAMDRP worksheet from Quality Assurance and complete all required data. If all pertinent data cannot be obtained by the work center, Quality Assurance shall provide assistance.

2. Hazardous Material Report (HMR).

a. The HMR provides a standard method for reporting material deficiencies, which, if not corrected, could result in death or injury to personnel or

damage to or loss of aircraft, equipment, or facilities.

b. An HMR shall be submitted by priority precedence message within 24 hours of discovery.

c. The following is reporting criteria for a HMR:

(1) Malfunction or failure of a component part which, if not corrected, could result in death or injury to personnel, or damage to or loss of aircraft, equipment, or facilities. In case of a naval aircraft mishap as defined in OPNAVINST 3750.6, the required reports will be submitted per OPNAVINST 3750.6. The submission of reports required by OPNAVINST 3750.6 does not negate any of the requirements for submission of reports required by the NAMP.

(2) Configuration deficiency which constitutes a safety hazard is discovered in aeronautical equipment, such as aircraft, SE, or components.

(3) Urgent action or assistance is required and corrective action must be completed at an early date because of an operational requirement.

(4) A condition is detected wherein the design of a part is such that incorrect installation can be easily accomplished and system malfunction or failure may occur.

(5) An in-flight or ground loss of aircraft parts in which maintenance or material factors are involved. The terminology, things falling off aircraft (TFOA), is used when referring to such incidents. TFOA includes incidents generally categorized in other areas, such as a FODed engine, which sheds parts or a helicopter rotor blade pocket failure.

3. Explosive Mishap Report (EMR)/Conventional Ordnance Deficiency Report (CODR).

a. These reports are used for reporting explosive incidents, dangerous defects, and malfunctions or failures involving explosive systems, launch

devices, and AWSE per References (a) and (d). These reports still fall under NAMDRP for accounting and monitoring purposes.

b. Reporting criteria for an EMR is as follows:

(1) A malfunction or failure of an explosive system, launch device, or AWSE which, if not corrected, could result in death or injury to personnel, or loss of/damage to aircraft, equipment or facilities.

(2) Malfunction or failure of an explosive system as the result of failed material. This report is a combined EMR/QDR(Quality Deficiency Report).

(3) Urgent action or assistance is requested for an operational requirement.

(4) A condition is detected that improper installation can be easily accomplished and system malfunction may occur.

c. An EMR shall be submitted by priority precedence message within 24 hours of discovery.

4. Engineering Investigation (EI).

a. EI's are applicable to all aircraft and weapon systems, their subsystems, equipment, components, related support equipment, special tools, and fluids/materials used in the operation of the equipment.

b. The EI Program provides for the following:

(1) Provides an investigation process to determine the cause and depth of fleet reported material failures.

(2) Supports the investigation of material associated with aircraft mishaps, lightning strikes, electromagnetic interference, or stray voltage problems.

(3) Provides for investigation of components

rejected through the Naval Oil Analysis Program (NOAP).

(4) Supports the Scheduled Removal Components (SRC), the Assembly Service Record (ASR), and equipment history record by providing for investigation of high time and "on condition" components.

(5) It provides for engineering assistance relating to any fleet material problem.

(6) It supports the mandatory investigation requirements for activated aircraft escape systems in reference (c).

c. There are three types of EI's conducted: Disassembly and Inspection, Material Analysis, and Engineering Assistance.

d. An EI request shall be submitted by routine precedence message within 5 working days of the discovery of the discrepancy. Ensure the supporting supply activity and CFA supply activity are listed as Info Addressees on all EI requests.

5. Quality Deficiency Report (QDR).

a. The QDR Program provides maintenance activities with a method for reporting deficiencies in new or newly reworked material. Unless the items are under warranty, they must have zero operating time during initial operation/installation or first flight. A QDR differs from an EI request in that it reports on possible deficiencies in Quality Assurance during the manufacturing or rework process. The goal of this program is to improve the quality work done by Naval Aviation Depot (NADEP) contractors, and subcontractors.

b. The following is a definition of what constitutes new and reworked material:

(1) New is that which is procured under contract from the commercial/government sources/manufacturers by the organic facility. Material under warranty will be considered new

until the warranty expires.

(2) Reworked that which has been overhauled, rebuilt, repaired, or modified, but is unproven in actual use.

c. There are two types of QDR's:

(1) Category I - A quality deficiency which will, or may affect safety of personnel, impair the combat efficiency of an individual or organization, or jeopardize mission accomplishment.

(2) Category II - All quality deficiencies, which are assessed, to have significant and widespread material or human resource impact and do not affect the safety of personnel, impair the combat efficiency of an individual or organization, or jeopardize mission accomplishment.

6. Technical Publication Deficiency Report (TPDR).

a. As in other reports, TPDR's are sent when a deficiency is noted in a publication, MRC, WUC Manual, shop process cards, MIMs, etc. When a deficiency is detected where, if not corrected, could result in death or injury to personnel, or loss/damage to aircraft, equipment or facilities, then it shall be submitted as a CAT I TPDR by priority precedence message within 24 hours of discovery. Minor discrepancies such as wrong measurements, incorrect values, etc., are reported as CAT II TPDRs on an OPNAV 4790/66 form.

7. Combined NAMDRP Reports.

a. Combined NAMDRP reports, i.e. HMR/TPDR, HMR/CAT I QDR, CAT I QDR/TPDR, shall be submitted within the shortest time span and the highest priority precedence allowed, i.e. HMR/TPDR shall be submitted within 24 hours by precedence message. Never combine an EI with a CAT I QDR.

8. Handling and Preparation of EI/QDR Material.

a. Maintain material in an "as is" condition.

b. Exercise special care to ensure to cap/plug/package material immediately upon removal to prevent corrosion, contamination, etc.

c. Do not attempt adjustments, disassembly, or cleaning externally or otherwise.

d. If contamination is suspected, forward samples of fluids in clean, sealed containers.

e. Forward all failed fragments wrapped separately and securely to prevent damage. Do not try to reassemble the fragments.

f. When feasible, forward associated accessories, components, or material that may be suspected as contributing to the malfunction/mishap.

g. VIDS/MAFs, EI/QDR, SRC card/ASR/AESR shall accompany components and the VIDS/MAF shall be clearly marked "EI/QDR".

9. Aircraft Discrepancy Reports (ADR's).

a. This program provides for reporting defects discovered in newly manufactured, modified, or reworked aircraft that require immediate attention to ensure more acceptable standards of quality in aircraft maintenance and rework procedures.

b. Reporting Criteria.

(1) Effective use of the SF 368 in initiating corrective or preventive action is dependent upon a clear description of defects and corrective actions taken. Remarks must be in sufficient detail to identify the problem, the parts involved, and to permit objective analysis of the discrepancy.

(2) Equipment shortages, ferry or shipping damages, deterioration during pool storage, or other discrepancies that do not directly pertain to the quality of rework or manufacture are not reported by the reporting custodian.

Discrepancies that are not a part of the negotiated work package/rework specification shall not be included.

(3) An acceptance inspection is performed as soon as possible after the aircraft is delivered and prior to maintenance (other than required to complete the acceptance inspection) or other flight. Only those discrepancies noted by the pilot/ferry crew and those found during the acceptance inspection are reported.

(4) Discrepancies discovered during the initial acceptance inspection of aircraft received from a contractor as newly manufactured and those reworked by a Navy, commercial, or inter service activity would be reported as a CAT II QDR on the SF368. Discrepancies found on subsequent flights/inspections, which may be attributed to contractor/rework action, may be reported as a supplemental ADR, if submission is within 30 days after the reporting custodian receives the aircraft.

(5) This report is used to report all discrepancies, as defined by ref (a), found by the using activity on aircraft received from a contractor or a rework activity, as well as to evaluate the rework activity's quality control system. Critical, major and minor discrepancies are defined as follows:

1 Defect, Critical - A defect that constitutes a hazardous or unsafe condition, or as determined by experience and judgment could conceivably become so, thus making the aircraft unsafe for flight or endangering operating personnel.

2 Defect, Major - A defect, other than critical, that could result in failure or materially reduce the usability of the unit or part for its intended purpose.

3 Defect, Minor - A defect that is not likely to reduce materially the usability of the unit or product for its intended

purpose, or is a departure from established standards having little bearing on the effective use or operation of the unit.

(6) Critical discrepancies discovered during initial inspection of the aircraft shall be reported by message in accordance with reference (a). Discrepancies reported, as CAT I QDR will be referenced in Block 22 of the SF 368 used to report the initial acceptance of the aircraft. This dual reporting will provide data for immediate action on CAT I QDRs and assist in the complete investigation of all discrepancies on the specific aircraft.

c. In reporting the initial acceptance of an aircraft, the subject of the SF 368 will be "Initial Acceptance Inspection of Aircraft". This report will be submitted as soon as possible, but not later than 30 days after receipt of an aircraft.

J. SUMMARY: The NAMDRP is an effective tool for identifying and initiating corrective action in discrepancies discovered in material, publications, substandard workmanship, improper maintenance and/or Quality Assurance procedures. The NAMDRP is vital to the safety of all personnel and aircraft and must be utilized properly to ensure that safety.

K. QUESTIONS AND ANSWER PERIOD:

NOTE:
IF NO DISCREPANCIES ARE FOUND ON INITIAL ACCEPTANCE, A NEGATIVE RESPONSE WILL BE SUBMITTED STATING *"NO DISCREPANCIES NOTED, REPLY NOT REQUIRED"* IN BLOCK 22 ON SF 368.

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-13

ELECTROSTATIC DISCHARGE (ESD) ELECTROMAGNETIC INTERFERENCE (EMI)

A. LECTURE NUMBER: G-13

B. TIME: TBD Minutes

C. DATE PREPARED: 3 August 2001

D. DATE REVIEWED: 10 August 2001

E. TITLE: ELECTROSTATIC DISCHARGE (ESD) ELECTROMAGNETIC INTERFERENCE (EMI)

F. OBJECTIVE: To familiarize personnel with what Electrostatic Discharge (ESD) and Electromagnetic Interference (EMI) are, common sources of ESD and EMI, the effects of ESD and EMI on equipment, protective measures for personnel and equipment, and program requirements and responsibilities.

G. INSTRUCTIONAL AIDS:

1. Movie "ESD: The Invisible Threat" 25 minutes videotape.

2. ESD sensitivity symbols, ESD protective materials, ESD protective tools and equipment.

3. Other visual aids such as VU-graph diagrams of grounded work stations, pictures and brochures of ESD protective tools and equipment, and photographs of damaged ESD items.

H. REFERENCES:

1. MIL-HDBK-263B, Electrostatic Discharge Control Handbook for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Initiated Explosive Devices).
2. MIL-STD-1686, Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment.
3. NAVAIR 01-1A-23, Standard Maintenance Practices Miniature/Micro-miniature (2M) Electronic Assembly Repair
4. NAVSUP Publication 484, Supply Afloat Fleet and Field Packaging Procedures
5. NAVSUPINST 4030.46, Protection of Items Susceptible to Damage from Electrostatic Discharge

6. NAVSUPINST 4440.179, Report of Discrepancy (ROD) Manual
7. NAVAIR 17-600-141-6-1, Pre-Operational Checklist for Micro-miniature Repair Station
8. NAVAIR 17-600-141-6-2, Micro-miniature Repair Station Naval Air Engineering Center (GHS2)
9. NAVAIR 17-600-193-6-2, PRC-2000-2M System Maintenance Requirement Cards
10. MIL-HDBK-773, Electrostatic Discharge Protective Packaging
11. NAVAIR 00-80T-117, Electromagnetic Compatibility Theory and Practice Manual
12. NAVSEA OP 3565, Electromagnetic Radiation Hazards, (Hazards to Personnel, Fuel, and Other Flammable Materials)
13. OPNAVINST 2450.2, Electromagnetic Compatibility Program within the Department of the Navy
14. OPNAVINST 4790.2H, Naval Aviation Maintenance Program (NAMP)
15. OPNAVINST 3750.6R, The Naval Aviation Safety Program
16. ANSI C63.14-1998, American National Standard Dictionary for Technologies of Electromagnetic Compatibility (EMC), Electromagnetic Pulse (EMP), and Electrostatic Discharge (ESD)

I. PRESENTATION: All personnel involved with handling storage, packaging, or maintenance of ESDS components/WRA's will be aware of the Electrostatic Discharge Control Program as outlined in references (1) through (16). Personnel safety cannot be overemphasized in this program. In the past, technicians have always been isolated from electrical shock by non-conductive material/devices. The technician is now tied to a "soft ground" that is tied to a hard ground (a connection to ground through an impedance sufficiently high to limit current flow to safe levels for personnel (normally 5 milliamperes)). Impedance needed for soft ground is dependent upon the voltage levels, which could be contacted by the personnel near the ground.

1. Electrostatic Discharge

   a. <u>ESD Terms and Definitions</u>

      (1) Electrostatic Discharge (ESD): The transfer of an electrostatic charge between bodies at different electrostatic potentials (voltages) caused by direct contact or induced by an electrostatic field.

(2) Electrostatic: A non-moving electric charge.

(3) Triboelectric effect: Method of generating static electricity by friction(rubbing or separating materials).

(4) Electrostatic Discharge Sensitive (ESDS): Any device that is sensitive to damage from an electrostatic discharge.

(5) Human Body Model (HBM): Electrostatic discharge from a charged person.

b. ESD Theory

(1) Causes of ESD

(a) Tribo-electric charges cause at least 98% of all ESD damage. When two materials make contact, and are then separated (causing friction), electrons are stripped from one material and transferred to another. This imbalance creates a static charge to accumulate on the materials.

(b) Humidity has a definite effect on how easily a static charge is generated. The lower the relative humidity, the higher the potential static charges.

(c) The following is a list of typical static charges, and how they are generated:

Means of Generation	**Relative Humidity and Voltage**
Walking across carpet:	10-20% humidity = 35000v
	65-90% humidity = 1500v
Walking over vinyl floor:	10-20% humidity = 12000v
	65-90% humidity = 250v
Worker at bench:	10-20% humidity = 6000v
	65-90% humidity = 100v
Padded Chair:	10-20% humidity = 18000v
	65-90% humidity = 1500v

(2) Damage and failures caused by ESD

(a) Many ESDS devices have very low resistances to ESD. In many cases, the voltages are in the 20-1000v ranges.

It should be noted that the human body couldn't feel, hear, or see an electrostatic discharge that is below around 3000 volts. Many times the human body has a charge that is less than that, resulting in a discharge (and damage) that is undetectable by conventional means.

(b) Two types of failure:

1 Catastrophic Failure: The device no longer meets design performance standards.

2 Latent Defect (Intermittent Defect): The device meets design performance standards, but will fail before the end of intended design life, or will fail intermittently.

c. ESD Control

(1) ESD Safe Area and ESD Control

(a) Maintain Packing Integrity: Proper packaging, as described in MIL-HDBK-773 and MIL-STD-2073, must be maintained until the ESDS device is in a designated ESD Safe Area, where it can be properly handled.

(b) Grounded Dissipative Surfaces: The work surfaces used in an ESD Safe Area must be grounded and specifically designed to slowly dissipate an electric charge (i.e., ESD Mat).

(c) All Safe Areas and ESDS items must be properly labeled: The ESD Safe Area and all ESDS devices should always be plainly labeled.

(d) Wrist Strap: A grounded wrist strap should always be worn when handling ESDS devices.

(e) Common Ground: All grounded items in an ESD Safe Area must be grounded to one common point.

(f) ESD Safe Storage Area: When an ESDS device is awaiting parts, or is being stored; the device should be properly packaged and kept in an ESD Safe Storage Area.

(g) No Prime Generators: Keep all of the following out of ESD Safe Areas, as they are prime generators of electrostatic charges:

Plastic tape
Styrofoam cups
Clear bubble-wrap
MAF bags
Regular plastics
Aerosol cans
Cellophane tape
Paper
Document protectors
Masking tape

2. Electromagnetic Interference

d. <u>EMI Terms and Definitions</u>

(1) Electromagnetic Interference (EMI): Any electrical, electronic, or electromagnetic disturbance, signal, or emission (man-made or natural) that interrupts, obstructs, or otherwise impairs the performance of electronic equipment.

(2) Airframe/hull generated EMI: EMI caused by the interaction of radiated signals with the elements of the airframe/hull.

(3) Bonding: Connecting together the metal parts of an aircraft, vehicle, structure, or housing to prevent interference-producing static or RF voltage buildup between adjacent metal parts.

(4) Conducted Interference: Undesired electromagnetic energy that is propagated along a conductor, usually defined in terms of a voltage and/or current level.

(5) Corona Discharge: An electrical discharge due to ionization of the surrounding air by high voltage that appears as a glow on the surface of, and adjacent to a conductor.

(6) Cosmic/galactic/solar noise: Interference caused by electromagnetic phenomenon outside the earth's atmosphere.

(7) Electromagnetic Compatibility (EMC): The ability of electronic equipment to operate in its intended electromagnetic environment without causing or undergoing unacceptable degradation because of undesired electromagnetic radiation or response.

(8) Electromagnetic Disturbance: A random or periodic electromagnetic phenomenon, usually impulsive, that is superimposed on a desired signal.

(9) Electrostatics: The science that deals with electricity at rest.

(10) Filtering: A network of one or more electronic components designed to offer comparatively little opposition to certain frequencies (or to direct current) while blocking other frequencies.

(11) Functional EMI: EMI generated by electrical or electronic systems designed to generate, distribute, and radiate electromagnetic energy.

(12) Grounding: Provides equipment with a common potential reference point anywhere in the system so that no voltage exists between any two grounded points.

(13) Incidental EMI: Any EMI generated by a device that is not designed to generate such energy during normal operation.

(14) Precipitation static: Electromagnetic disturbance caused by the random electrostatic discharge created as a result of the potential buildup caused by the charge transfer between air, moisture, and airborne particles and the structure of a vehicle moving in the atmosphere, such as an aircraft or spacecraft.

(15) Radiated EMI: The free space transference of electromagnetic energy.

(16) Shield (electromagnetic): A conductive housing or screen that substantially reduces the effect of electric or magnetic fields on devices or circuits.

(17) Time Sharing: Essentially, while one system is operating, other system(s) are turned off to prevent interference.

e. EMI Causes: The EMI triangle - In order for EMI to exist, there must be a source, a victim, and a coupling path for the interference. Sources are either natural or man-made. Natural sources of EMI include cosmic, solar, and galactic radiation, lightning, precipitation static, and electrostatic discharge. Man-made sources of EMI include incidental EMI, functional EMI, airframe/hull generated. Coupling paths can be radiated, conducted or a combination of the two.

f. Prevention and Control: The most practical methods for preventing and controlling EMI are grounding, bonding, shielding, and filtering.

g. Other Considerations:

(1) During an airframe’s life cycle, it can undergo many changes. Every change, whether structural or electronic, can impact the aircraft's EMI environment. While you may not control these changes, be aware of the other aspects of system performance.

(2) Equipment placement is designed to reduce mutual interaction between systems equipment by

placing them so that they are separated by distance or shielded by enclosures.

(3) Frequency management is the separation of two or more electronic systems by operating frequencies, harmonics, and spurious responses.

(4) Time-sharing is a system management tool that should only be used when other corrections have failed.

(5) Blanking is the disabling susceptible equipment during a period in which a pulsed emitter would cause interference.

h. Recognition of EMI Problems: Certain avionic systems/work centers may experience the following discrepancies. These problems can easily be attributed to the effects of EMI.

(1) Communication/Navigation:

(a) TACAN loss/false lock
(b) UHF/VHF radio weak reception
(c) Omega/Loran systems, ambiguous position indications
(d) Interference between unrelated COM/NAV systems

(2) IFF/Radar:

(a) False interrogations/identifications
(b) Intermittent operation of ground-mapping radar
(c) Interference with Ground Proximity
(d) Loss of radar sensitivity

(3) Flight Controls:

(a) Uncommanded control inputs
(b) Loss of AFCS

(4) Weapons Systems:

(a) Inadvertent firing of weapons
(b) Inadvertent jettison of stores
(c) Inaccurate guidance

(5) Ancillary Systems:

(a) Incorrect fuel quantity readings
(b) Incorrect landing gear position indication

3. The key to effective action against the effects of EMI rests in the ability of the personnel involved to gather the information, identify the victims and possible sources. Noting the victim's geographical location as well as attitude, altitude, heading, or position can be critical in determining the cause of and prevention of EMI. Other items to consider are weather conditions, time of day, and other platforms in the vicinity during the interference.

4. All suspected occurrences of EMI must be reported. By alerting QA and utilizing VIDS/MAF documentation and plain-language messages for hazardous EMI reports, any trends in EMI can be identified and eliminated. Formal messages (Hazardous Material Reporting, Engineering Investigations, Explosive Mishap Reporting) can go one step further to alert manufacturers and depot maintenance of present and future design considerations.

5. The Naval Safety Center, through OPNAVINST 3750.6R (Naval Aviation Safety Program), requires that ANY known or suspected EMI problem be reported via Hazard Reports.

J. SUMMARY: The proper procedures for the protection of Naval aircraft and their systems from EMI damage cannot be overemphasized. Proper maintenance, corrosion detection/ prevention, and proper handling of equipment must be maintained at all times to ensure that the aircraft is always fully operational and mission capable.

NOTE:
REFER TO NAMP SOP (Volume 5, Chapter 22) FOR ADDITIONAL AND SPECIFIC INFORMATION.

K. QUESTIONS AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-14

AIRCRAFT COMPASS CALIBRATION PROGRAM

A. LECTURE NUMBER: G-14

B. TIME: 1 Hour

C. DATE PREPARED: 21 June 1991

D. DATE REVIEWED: 7 February 1997

E. TITLE: AIRCRAFT COMPASS CALIBRATION PROGRAM

F. OBJECTIVE: To familiarize maintenance personnel with the responsibilities and procedures of managing an effective Aircraft Compass Calibration Program.

G. INSTRUCTIONAL AIDS:

1. OPNAVINST 4790.2_

2. Appropriate MIM's, specifications/related engineering directives

3. Applicable Squadron Maintenance Instructions

H. REFERENCES:

1. OPNAVINST 4790.2_

2. MIL-STD-765A (NOTAL)

I. PRESENTATION. The primary objective of the Compass Calibration Program is to enhance flight safety by ensuring that all calibration readings are maintained within limits specified for a specific aircraft.

1. AIRCRAFT COMPASS CALIBRATION PROGRAM

    a. O-level maintenance activities shall:

        (1) Comply with aircraft compass requirements and procedures in the OPNAVINST 4790.2_ and MIL-STD-765A (NOTAL), and applicable MIM's.

        (2) Ensure adequate training of involved personnel in matters pertaining to aircraft compass calibration.

(3) Ensure supervisory and QA personnel are thoroughly familiar with MIL-STD-765A (NOTAL) and the criteria set forth therein.

b. Command: Refer to the local maintenance instruction for all command responsibilities under the Aircraft Compass Calibration Program.

c. Maintenance Officer: Responsible for ensuring the monitoring of the Aircraft Compass Calibration Program.

d. Material Control Officer: Coordinates the Aircraft Compass Calibration Program and ensures appropriate documentation.

e. Maintenance Personnel: Perform swings IAW applicable procedures. The term "compass system" is defined as any system or instrument which uses the earth's magnetic field as it's primary source of heading information whether employed as a navigational aid, computer input for weapons delivery systems, or magnetic variation computations in inertial navigation.

2. Compass systems within naval aircraft shall be calibrated:

a. Upon initial installation following the change of a major compass system component which affects the accuracy of the compass system.

b. Following any flight in which it is determined that significant errors exist in any of the aircraft compass systems.

c. At least once each twelve months from the last calibration.

d. Within ninety days prior to a scheduled extended deployment of sixty days or more.

NOTE:
THE ABOVE COMPASS SWING REQUIREMENTS DO NOT APPLY TO AIRCRAFT WITH DUAL, INDEPENDENT INERTIAL NAVIGATION SYSTEMS. REQUESTS FOR DEVIATION TO THE ABOVE CALIBRATION INTERVAL WILL BE DIRECTED TO THE RESPECTIVE ACC/TYCOM.

3. Documentation of compass calibration maintenance actions shall be in accordance with the following paragraphs:

   a. Compass calibration, as a result of paragraphs 2a and b, will be documented on the same VIDS/MAF reporting correction of the discrepancy.

   b. Compass calibrations as a result of paragraphs 2c and d, will be considered as a "conditional calibration requirement" therefore, this action will be documented as {R} a conditional inspection on the VID/MAF.

   c. Appropriate compass correction cards shall be displayed in the aircraft requiring them and shall be located near compass indicators with the date of system calibration. In addition, a copy of each current compass correction card shall be maintained in the manila envelope located inside the back cover of the aircraft logbook, OPNAV 4790/19.

   d. Refer to OPNAVINST 4790.2_ for requirements on aircraft logbook entries.

4. Methods of calibration:

   a. Electrical compensation, MC-1000 or equivalent, is the preferred method.

   b. Compass rose is the secondary method.

   c. Any of the other methods described in MIL-STD-765A (NOTAL) are authorized as alternate methods.

J. SUMMARY: The effectiveness of any program relies directly on the perspective of the individuals that are responsible for it's implementation and use. The primary objective of a comprehensive Aircraft Compass Calibration Program is to eliminate accidents and mishaps that are a result of faulty aircraft compass system readings.

K. QUESTIONS AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5001

LESSON GUIDE NUMBER: G-15

CORROSION CONTROL PROGRAM

A. LECTURE NUMBER: G-15

B: TIME: 1 Hour

C: DATE PREPARED: 25 June 1990

D: DATE REVIEWED: 7 February 1997

E: TITLE: CORROSION CONTROL PROGRAM

F: OBJECTIVE: To familiarize maintenance personnel with the Corrosion Control Program. The lesson will also describe the types of corrosion, detection, prevention, treatment methods, safety, and documentation procedures used.

G: INSTRUCTIONAL AIDS:

1. Squadron aircraft
2. Aircraft Engine
3. TYCOM
4. Squadron Support Equipment
5. Utilize references below (as applicable)

H: REFERENCES:

1. OPNAVINST 4790.2

2. NA-01-1A-509

3. NA-16-1-540

4. NA-15-01-500

5. NA-17-1-125

I. PRESENTATION: The Corrosion Control Program as outlined in reference (a) covers a wide area of systems, components and equipment. The major concern in corrosion control is "PREVENTION". The detection and treatment of corrosion are important skills and all maintenance personnel should be familiar with these methods to ensure integrity of all aircraft systems, components and equipment.

1. Types of corrosion:

    a. Direct surface attack.

    b. Galvanic or dissimilar metal corrosion

    c. Inter-granular corrosion

    d. Pitting

    e. Exfoliation

    f. Crevice attack or concentrated cell corrosion

    g. Fretting corrosion

    h. Stress corrosion

    i. Corrosion fatigue

    j. Filiform Corrosion

2. Detection of Corrosion:

    a. Direct surface attack:

        (1) On aluminum it appears as a white or gray powder.

        (2) On magnesium it appears as a white powdery, snow-like mounds and white spots on the surface.

        (3) On non-stainless steel alloys it appears as reddish brown rust.

        (4) Copper based alloys and brass/bronze will have a blue-green powder deposit.

        (5) Cadmium will have white powder deposits.

    b. Galvanic or dissimilar metal corrosion:

        (1) Will initially have the same base appearance as surface corrosion.

c. Inter-granular corrosion:

(1) An attack, which occurs along the grain boundaries of some alloys under specific conditions normally caused by improper heat treatment. Localized overheating may contribute to this corrosion.

d. Pitting corrosion:

(1) Will be the same as surface corrosion; Magnesium alloys are extremely susceptible to this type of corrosion.

(2) Aluminum alloys will appear with pits and the same corrosion by-product as surface corrosion.

(3) Chromium, which is used as wear resistant plating, does not corrode. It is however, subject to pitting in a chloride environment.

e. Exfoliation corrosion:

(1) An advanced stage of inter-granular corrosion and is normally detected by bulging followed by the falling away or peeling off in flakes, layers or scales which occurs when the grains of a metal are greatly elongated in one direction as compared with the other two directions.

f. Crevice attack or concentrated cell corrosion:

(1) This type of attack is generally evidenced by crevices, scale, surface deposits and stagnant water traps.

g. Fretting corrosion:

(1) This type of attack develops when two heavily loaded surfaces in contact with each other are subject to slight vibratory motion or oscillation.

h. Stress corrosion cracking:

(1) This is a process requiring the combined action of corrosion and sustained tensile stress.

(2) Examples of where this type of corrosion may occur is aluminum alloy bell cranks, landing gear shock struts with pipe threaded grease fittings, clevis joints, shrink fits and exposed or over stressed tubing B-nuts.

i. Corrosion fatigue:

(1) This is a result of cyclic stresses on metal in corrosion surroundings rather than the sustained static loads that cause stress corrosion cracking.

(2) Corrosion will result in a shallow pit in the stressed area, and as it continues will develop into sharp deep pits, which will become the origin of cracks that may result in the failure of the part.

j. Filiform corrosion:

(1) Metals coated with organic substances, such as paint may undergo a type of corrosion resulting in numerous meandering filaments known as Filiform corrosion.

(2) This type of corrosion occurs from the permeation of moisture through the painted surfaces under conditions of high humidity and high ambient temperatures.

3. Prevention of corrosion:

a. Airframes shop:

(1) Prevention methods are covered in references (b) and (d). These publications shall be used and the appropriate Maintenance Manuals as applicable when performing any corrosion prevention methods.

(2) Materials required to prevent corrosion from occurring can be found in these manuals.

NOTE:
THE INSTRUCTOR SHOULD UTILIZE THESE MANUALS AS A TRAINING VEHICLE DURING THIS PERIOD OF INSTRUCTION..

b. Avionics:

(1) Prevention methods are covered in reference (c). This publication shall be used and the appropriate Maintenance Manuals as applicable when performing any corrosion prevention methods.

NOTE:
THE INSTRUCTOR SHOULD UTILIZE THESE MANUALS AS A TRAINING VEHICLE DURING THIS PERIOD OF INSTRUCTION.

c. Power Plants/Flight Line:

(1) Prevention methods are covered in reference (e). This publication shall be used and the appropriate Maintenance Manuals as applicable when performing any corrosion prevention methods.

NOTE:
THE INSTRUCTOR SHOULD UTILIZE THESE MANUALS AS A TRAINING VEHICLE DURING THIS PERIOD OF INSTRUCTION.

d. Support Equipment (SE):

(1) Prevention methods are covered in reference (f). This publication shall be used and the appropriate Maintenance Manuals as applicable when performing any corrosion prevention methods.

e. Maintenance personnel:

(1) A successful corrosion prevention program is the result of a concentrated effort by all Operating maintenance and support personnel involved with:

(a) Reduced maintenance time spent repairing corrosion damage.

(b) Reducing the number of maintenance actions.

(c) Increasing reliability and longevity of aircraft/SE.

(2) All maintenance personnel shall be familiar with the types and detection information contained in reference (b). As a minimum maintenance personnel (as applicable to MOS) will perform all prevention methods required by Maintenance Manuals.

(3) Materials used in prevention of corrosion are contained in reference (b) and shall be used as applicable.

NOTE:
ALL INSTRUCTORS SHALL, AS A MINIMUM, ENSURE PERSONNEL ARE FAMILIAR WITH TYPES, DETECTION AND PREVENTION METHODS TO THE DEGREE THAT PROVIDES SKILLS NECESSARY TO COMPETENTLY COMPLETE ASSIGNED MAINTENANCE TASKS WHICH MAY OR MAY NOT INCLUDE CORROSION CONTROL.

(4) All Maintenance Requirement Cards (MRCs) for all Prevention methods shall be complied with utilizing materials indicated in the applicable MRC’s for the maintenance task being performed.

4. Treatment of corrosion:

a. Methods:

(1) Treatment methods are covered in applicable Maintenance Manuals and references (b) thru

(f). These should be covered as applicable to MOS.

(2) Treatment of corrosion shall be performed by qualified personnel that are trained in the preparation of surfaces, application of materials and removal of corrosion. This is to ensure proper treatment is applied to prevent continued corrosion of the affected material. Application of corrosion prevention shall be by the mildest means possible.

5. Safety:

a. Many materials used in the prevention and treatment of corrosion control are hazardous. All precautions for use of these materials shall be observed while in use. Materials listed below are examples of types of hazardous materials:

(1) Paints

(2) Solvents

(3) Carbon fibers

(4) Paint removers

(5) Resins and epoxy adhesives

b. All safety precautions covered in references (b) thru (f) shall be complied with.

NOTE:
INSTRUCTORS SHALL COVER APPLICABLE SAFETY PRECAUTIONS CONCERNING THE USE OF MATERIALS, SAFETY DEVICES AND PROTECTIVE CLOTHING/EQUIPMENT NEEDED TO PERFORM CORROSION CONTROL MAINTENANCE TASKS. (AS APPLICABLE TO MAINTENANCE PERSONNEL PERFORMING THESE TYPES OF TASKS)

c. Safety in the corrosion control arena cannot be overemphasized. It is the responsibility of each individual to observe these precautions and to ensure a safe work environment for the workers as

well as any personnel, which may be in the vicinity of the task (s) being performed.

6. Aviation Corrosion Prevention/Control Maintenance, Material, Management 3M Documentation Procedures.

   a. Guidance and amplification of 3M documentation required by reference (a) is provided as follows:

      (1) Corrosion prevention is the act of cleaning (exterior washing/cleaning and interior cockpit cleaning), and touch up painting to prevent the occurrence of corrosion. Special tools are not normally required for actions of this nature. Corrosion preventive actions not accomplished as part of scheduled NAVAIR publication MRC deck inspections shall be documented in accordance with reference (a).

      (2) Corrosion treatment is the act of correcting a known corrosion discrepancy. In this situation, corrosion is present and must be removed as part of the corrosion action. This type of action will normally involve the use of special tools/materials to remove corrosion, chemical treatment of there worked areas and touch up of the paint finish. Corrosion treatment actions shall be documented using the VIDS/MAF (OPNAV4790/60) in accordance with reference (a).

7. Organizational/Intermediate Level.

   a. Corrosion prevention actions, including aircraft washing, lubrication and application of operational preservation, accomplished as part of scheduled Daily/Special inspections, (MRCs) will be documented on VIDS/MAF in accordance with reference (a). In block A22, the first six positions will be "03000". In the case of a specific corrosion inspection, i.e. 28 Days Special Corrosion Inspection, the WUC will be "03000", the seventh position will indicate the inspection interval as selected from reference (a). Where no specific NAVAIR published scheduled corrosion inspection exists and local procedures are established, the WUC will be "040". Only Look Phase man-hours are documented.

Preservation/depreservation actions shall be documented using the VIDS/ MAF in accordance with reference (a).

J. SUMMARY: As you can see Corrosion Control has an impact on all aspects of maintenance and our environment. However with adherence to existing instructions it can be a safe well-managed program that will greatly reduce the deterioration of aircraft, systems, components and the equipment used in maintaining these assets. This program saves lives and assets when personnel are actively participating in the Corrosion Control Program.

K. QUESTIONS AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-16

EGRESS SYSTEM CHECKOUT PROGRAM

A. LECTURE NUMBER: G-16

B. TIME: 1 Hour

C. DATE PREPARED: 22 June 1992

D. DATE REVIEWED: 7 February 1997

E. TITLE: EGRESS SYSTEM CHECKOUT PROGRAM

F. OBJECTIVE: To familiarize maintenance personnel with the responsibilities and procedures of managing an effective Egress System Checkout Program.

G. INSTRUCTIONAL AIDS:

1. Applicable Aircraft MIM's

2. Applicable Local Squadron Instructions

H. REFERENCE:

1. OPNAVINST 4790.2_

I. PRESENTATION. Due to the inherent dangers associated with egress systems, an egress system checkout procedure is required.

1. EGRESS SYSTEM CHECKOUT PROGRAM

   a. Maintenance Officer: Responsible for the Egress System Checkout Program.

   b. Quality Assurance is responsible for:

      (1) Personnel performing checkouts are qualified Aviation Structural Mechanic, Safety Equipment Mechanic (AME's).

      (2) Egress system checkouts are to be given to all new maintenance personnel prior to performing any aircraft maintenance and every six months thereafter.

(3) Personnel removed from aircraft maintenance responsibilities for over 90 days receive an egress system checkout before performing any maintenance.

(4) Proper records are maintained.

c. The egress/environmental system work center:

(1) Is responsible for indoctrinating all personnel in the hazards and safety precautions associated with egress systems. The egress system checkout program will be established by a squadron Maintenance Instruction. All personnel will be given a thorough checkout by qualified personnel.

(2) The egress/environmental system work center will maintain master file IAW Ref. (a), and the other maintenance work centers will maintain records of egress system checkouts, including date given, day/month/year, and the signature of the person performing the checkout.

(3) Personnel due egress system re-qualification are listed monthly in the Monthly Maintenance Plan.

NOTE:
REFER TO LOCAL INSTRUCTIONS FOR PROGRAM IMPLEMENTATION ON PARTICULAR AIRCRAFT USE.

NOTE:
HAVE QUALIFIED PERSONNEL EGRESS SYSTEMS LECTURE AT THIS TIME.

J. SUMMARY: The primary objective of a comprehensive Egress System Checkout Program is to eliminate accidents and mishaps as a result of carelessness or lack of knowledge while working on or near an aircraft's egress system.

K. QUESTIONS AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-17

AIRCRAFT FUEL SURVEILLANCE PROGRAM

A. LECTURE NUMBER: G-17

B. TIME: 1 Hour

C. DATE PREPARED: 21 June 1991

D. DATE REVIEWED: 7 February 1997

E. TITLE: AIRCRAFT FUEL SURVEILLANCE PROGRAM

F. OBJECTIVE: To familiarize maintenance personnel with the responsibilities and procedures of managing an effective Aircraft Fuel Surveillance Program.

G. INSTRUCTIONAL AIDS:

1. OPNAVINST 4790.2, Volume V.
2. MIL-STD-765A (NOTAL).
3. Appropriate MIM's, specification/related engineering directives.
4. Applicable Local Squadron Maintenance Instructions.

H. REFERENCE:

1. OPNAVINST 4790.2
2. NA 01-1A-35 (NOTAL)
3. NA 10-40-2
4. NAVAIRINST 10340.2_ (NOTAL)

I. PRESENTATION: Free water and foreign contaminants in aircraft fuel systems, singularly or in combination, constitute a hazard in naval aircraft. Harmful affects of water, particulate, and microbiological growth include erratic or incorrect fuel quantity indications, icing of filters, valves, and other fuel system components, and engine failure caused by carburetor/fuel control icing or malfunction, and jet engine starting difficulties. Further, if contamination remains undetected, rubber fuel cells will deteriorate and be permanently damaged. Constant vigilance is required to ensure clear, bright, and water free fuel is delivered to the aircraft and subsequently to their engines.

1. AIRCRAFT FUEL SURVEILLANCE PROGRAM

    a. Command: Refer to the local maintenance instruction for all command responsibilities under the Aircraft Fuel Surveillance Program.

    b. Maintenance Officer: Responsible for ensuring the Monitoring of the Aircraft Fuel Surveillance Program.

    c. Maintenance Personnel: Perform fuel sampling IAW applicable procedures.

2. Program Manager Will ensure that:

    a. Those personnel charged with sampling aircraft fuel systems are provided the technical information required for carrying out the program.

    b. A positive means has been identified to locally record, by tanks sampled, and who actually took the sample.

    c. Procedures exist to have flight crews and pilots thoroughly familiar with sampling requirements and procedures, and tank locations prior to any flight which may require performance of fuel sampling at an away from home location.

    d. Fuel drained from aircraft during fuel sampling is disposed of safely and in accordance with established published procedures.

    e. Proper sampling procedures are being followed. This will be verified on periodic basis.

3. Personnel responsible for maintaining quality and limiting contamination of aircraft fuels should refer to NAVAIRINST 10340.3_ (NOTAL) for specific details concerning:

    a. Characteristics of aircraft fuels.

    b. Allowable limits of deterioration and contamination in aircraft fuels.

    c. Disposition of fuel removed from the aircraft.

d. Principles of aircraft fuel handling.

e. Minimum equipment standards for filtration, water separation, and monitoring of aviation fuels.

f. Sampling and testing requirements and procedures for aircraft fuels.

g. Sampling and sample shipping instructions.

h. Contamination detectors.

i. Change of grade procedures for aircraft fuels.

j. Aviation fuel visual quality standards.

k. Petroleum testing laboratories.

4. Effective filtration, handling procedures, and QA on fuel delivered to naval aircraft have minimized incidents of fuel contamination problems. However, small amounts of free water are introduced in aircraft fuel tanks as a result of the condensation of moist air in empty or partially filled tanks and by the separation of water in solution in fuels when exposed to relatively low ambient temperatures. Microbiological growth, consisting of living organisms that grow at a fuel water interface, can grow to a troublesome stage if, and only if, free water is present. Particulate matter contamination may be generated within the aircraft fuel tanks and lines or introduced during maintenance. Aircraft operators must, therefore, inspect for water and foreign matter in aircraft fuel tanks on a scheduled basis.

5. Reporting custodians of naval aircraft and flight crews when away from home station shall ensure that fuel sampling is accomplished in strict accordance with NA 01-1A-35 (NOTAL), MIM's, MRC's (NA 01-XXX-6-X), or the applicable Air Force, Army, or Federal Aviation Administration approved equivalents.

   a. Fuel samples shall be taken before the first flight of the day from all fuel cells/tanks low point drains, this includes auxiliary, removable, and in flight refueling tanks.

b. To facilitate the management and monitoring of these sampling requirements, a locally prepared form/record, with space for the following information, shall be used for all samples taken: bureau number, fuel cells/tanks low point drains sampled, date, time, plane captains signature, supervisor or QA signature and remarks. Fuel samples taken from aircraft will be visually checked by individual taking the samples and verified visually by their supervisor, pilot, or a QAR/CDI. After record entries are made, the fuel samples will be disposed of unless conditions indicate further testing is warranted. The record entries will be retained for three months.

c. Aircraft engine fuels are presently classified into type, that is, piston engine fuel and turbine engine fuel, and by grades within each type. There are certain limitations regarding the interchangeability of the various grades and these limitations must be adhered to at all times. A listing of approved (primary and alternates) and emergency fuels is in NAVAIRINST 10341.3_ (NOTAL).

J. SUMMARY: The objective of the Aircraft Fuel Surveillance Program is to achieve and maintain a satisfactory level of Fuel purity in naval aircraft, thereby providing for safe and efficient operation. Control of contamination is therefore a

NOTE:
WHENEVER EMERGENCY FUELS ARE USED CONSULT THE APPLICABLE AIRCRAFT NATOPS OR FLIGHT HANDBOOK REGARDING OPERATING RESTRICTIONS.

must and all methods of detection and control should be used in accomplishing this objective.

K. QUESTIONS AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-18

AVIATION GAS FREE ENGINEERING (AVGFE)

A. LECTURE NUMBER: G-18

B. TIME: 1 Hour

C. DATE PREPARED: 22 June 1992

D. DATE REVIEWED: 7 February 1997

E. TITLE: AVIATION GAS FREE ENGINEERING (AVGFE)

F. OBJECTIVE: To familiarize maintenance personnel with the AVGFE program to ensure a safe environment is maintained when working on aeronautical equipment fuel systems.

G. INSTRUCTIONAL AIDS:

1. Navy Aviation Gas Free Certificate.

2. Gas Free Engineering Flow Chart Instructions.

H. REFERENCE:

1. OPNAVINST 4790.2_

2. NAVAIR 01-1A-35

3. Local Instructions

I. PRESENTATION: Safety instructions as well as training and supervision of personnel are essential to accident-free fuel cell maintenance. Personal Protective Equipment (PPE) is a big part of that. Failure to comply with SAFETY precautions could result in loss of life, injury, and/or destruction of valuable property. Therefore, strict compliance to prescribed standards is MANDATORY.

1. EVALUATION PROCEDURES: Many factors must be evaluated before entry to a fuel cell or working in a confined space with fuel cells are accomplished. Some of these are:

   (a) Susceptibility of aviation fuel vapors to electrostatic ignition.

   (b) Generation & accumulation of static electricity.

(c) Fire guard.

(d) Safety observer.

(e) Support Equipment (SE) air support, etc.

(f) Time limit.

SHOW AND DISCUSS FLOW CHART HERE

2. GAS FREE ENGINEER CERTIFICATION:

(a) Who can be a GFE? Only personnel that have been to the OSH 245A-GAS FREE ENGINEERING FOR NAVAL AIRCRAFT FUEL CELLS TRAINING COURSE OR equivalent course.

(b) Prerequisites:

(1) One-year experience as an AVGFET, be a QAR representative with one year experience or a safety representative.

(2) The AVGFE and the AVGFET must meet the same requirements when dual roles are required.

AVGFET duties are outlined in ref (c), and should be discussed in this class.

3. RESPONSIBILITIES:

(a) All maintenance personnel must inform their work center supervisor when work requires them to enter a confined space either completely or partially that require GFE services.

(b) All personnel must report any condition, procedure or equipment that is unsafe.

(c) Once an area/item has been certified as "SAFE", the AVGFET must periodically check the area to ensure the conditions have not changed.

(d) The AVGFET will stop work in an area that is UNSAFE and evacuate personnel and notify their supervisor and a Maintenance Controller.

Discuss FIRE GUARD & SAFETY OBSERVERS responsibilities

4. DISTRIBUTION/CONTROL OF CERTIFICATE:

(a) One copy is posted at the main entrance to the space used for work.

(b) One copy at other access areas, which are open and accessible to personnel.

(c) One copy is retained by the AVGFET logbook.

(d) One copy goes to the maintenance control requesting gas free service.

(e) Other copies are distributed as required by the administrative or operational requirements peculiar to the activity.

J. SUMMARY: The Aviation Gas Free Engineering (AVGFE) Program is important in ensuring that a safe environment is maintained when working on or around aeronautical equipment fuel systems.

K. QUESTIONS AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-19

HAZARD COMMUNICATION PROGRAM

A. LESSON NUMBER: G-19

B. TIME: 1 Hour

C. DATE PREPARED: 15 June 1993

D. DATE REVIEWED: 7 February 1997

E. TITLE: HAZARD COMMUNICATION PROGRAM

F. OBJECTIVE: To familiarize personnel with the Hazard Communication Program; it's purpose, associated definitions, elements, and application.

G. INSTRUCTIONAL AIDS: Appropriate instructional aids shall be selected at the unit level.

H. REFERENCES:

1. 29 CFR 1910.1200 (Hazard Communication Standard).
2. NAVAIR A1-NAOSH-SAF-000/P-5100-1 (NAVAIROSH Requirements For The Shore Establishment)
3. OPNAVINST 4790.2 (Naval Aviation Maintenance Program).
4. OPNAVINST P5100.23 (Navy Occupational Safety and Health Program Manual).

NOTE:
THE 29 CODE OF FEDERAL REGULATIONS WHICH IS WRITTEN IN CIVILIAN TERMINOLOGY, NOT ONLY APPLIES TO THE CIVILIAN COMMUNITY BUT ALSO APPLIES TO THE ARMED FORCES. THE TERMINOLOGY USED IS SOMEWHAT DIFFERENT AND UNFAMILIAR TO THOSE OF US IN THE MARINE CORPS AND IS OFTEN CAUSE FOR CONFUSION IN DETERMINING APPLICATION OF CERTAIN REQUIREMENTS. IN THE "DEFINITIONS" PORTION OF THIS LESSON, TERMINLOLOGY WHICH MAY CAUSE CONFUSION HAS BEEN DEFINED IN TERMS OF PULICABILITY TO MARINE UNITS AND INDIVIDUAL MARINES.

I. PRESENTATION: Unit commanders and their Marines have a "Right to Know" about the hazards associated with the chemicals they use and or are exposed to. This transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and training.

1. Definitions:

   a. Chemical: Any element, chemical compound or mixture of elements and or compounds.

   b. Employee: A Marine who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies.

   c. Employer: A Marine unit engaged in operations where chemicals are either used, distributed, or are produced for use or distribution.

   d. Exposed: An employee is subject to a hazardous chemical in the course of employment through any route of entry (inhalation, ingestion, skin contact, or absorption, etc.), and includes potential (e.g. accidental or possible) exposure.

   e. Foreseeable emergency: Any potential occurrence such as but not limited to, equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the work place.

   f. Hazardous Chemical: Any chemical, which is a physical hazard or a health hazard.

   g. Material Safety Data Sheet (MSDS): Written or printed material concerning a hazardous chemical.

   h. Written program: Written order, standard operating procedure, or maintenance instruction.

2. Elements of the Hazard Communication Program

   a. Written Program:

(1) The 29 CFR requires that employers develop implement, and maintain at the work place, a written hazard communication program for their work places which at least describes the methods the employer will use in providing "labels and other forms of warning", "material safety data sheets", and "employee information and training".

b. Labels and other forms of warning:

(1) Employers are required to ensure that each container of hazardous chemicals in the work place is labeled, tagged or marked with the identity of the hazardous chemical(s) contained therein; and appropriate hazard warnings.

(2) Employers shall not remove or deface existing labels on incoming containers of hazardous chemicals unless the container is immediately marked with the required information.

(3) Employers shall ensure that labels or other forms of warning are legible, in English, and prominently displayed on the container, or readily available in the work area throughout each work shift.

c. Material safety data sheets (MSDS):

(1) Employers are required to have a material safety data sheet for each hazardous chemical, which they use.

(2) Copies of MSDS shall be maintained in the work place and shall be readily accessible during each work shift.

NOTE:
29 CFR CONTAINS REQUIREMENTS FOR CONTENT OF MSDS.

d. Employee information and training:

(1) Employers shall provide employees with information and training on hazardous chemicals

in their work area at the time of initial assignment, and whenever a new hazard is introduced into their work area.

(a) Information: Employees must be informed of the requirements of 29 CFR 1910.1200; Any operations in their work area where hazardous chemicals are present; and, the location of the written hazard communication program, including the required list (s) of hazardous chemicals, and material safety data sheets.

(b) Training: Training for employees shall include methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area, the physical and health hazards of chemicals in the work area, the measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and, the details of the hazard communication program developed by the employer, including an explanation of the labeling system and the MSDS, and how employees can obtain and use the appropriate hazard information.

J. SUMMARY: The hazard communication program is the federally required means by which all employers provide all employees, information about the hazardous materials to which they are exposed. This includes any chemical, which is known to be present in the work place in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency. It is imperative that training in hazard communication be specific to individual needs to ensure the safety of all. Remember, individual knowledge of the hazard communication program is the key indicator of program effectiveness.

K. QUESTIONS AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-19.1

MATERIAL SAFETY DATA SHEET (MSDS)

A. LESSON NUMBER: G-19.1

B. TIME: 1 Hour

C. DATE PREPARED: 15 June 1993

D. DATE REVIEWED: 7 February 1997

E. TITLE: MATERIAL SAFETY DATA SHEET (MSDS)

F. OBJECTIVE: To familiarize personnel with the Material Safety Data Sheet; it's purpose, content, and maintenance requirements.

G. INSTRUCTIONAL AIDS: Appropriate instructional aids shall be selected at the unit level.

H. REFERENCES:

1. 29 CFR 1910.1200 (Hazard Communication Standard).
2. NAVAIR A1-NAOSH-SAF-000/P-5100-1 (NAVAIROSH Requirements For The Shore Establishment).
3. OPNAVINST 4790.2 (Naval Aviation Maintenance Program).
4. OPNAVINST P5100.23 (Navy Occupational Safety and Health Program Manual).

NOTE:
THIS LESSON IS PART OF A SERIES OF LESSONS CONCERNING THE HAZARD COMMUNICATION PROGRAM. LESSON G-19 SHOULD BE REVIEWED WITH THE STUDENT PRIOR TO THIS LESSON BEING GIVEN.

I. PRESENTATION: As previously stated in lesson G-19, employers and employees have a "Right to Know" about the hazards associated with the chemicals they use and or are exposed to. The primary source of this information is the Material Safety Data Sheet. The 29 Code of Federal Regulations (29 CFR) requires all employers to have an MSDS for each hazardous chemical, which they use.

1. Content:

    a. The 29 CFR requires that each material safety data sheet be written in English and contain at least the following information:

        (1) The identity used on the label.

        (2) Physical and chemical characteristics of the hazardous chemical (such as vapor pressure and flash point).

        (3) The physical hazards of the chemical, including the potential for fire, explosion, and reactivity.

        (4) The health hazards of the hazardous chemical, including signs and symptoms of exposure, and any medical conditions, which are generally recognized.

        (5) The primary route(s) of entry.

        (6) The OSHA permissible exposure limit (PEL), ACGIH Threshold Limit Value (TLV), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the material safety data sheet where available.

        (7) Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Annual Report on Carcinogens, or has been found to be a potential carcinogen in the International Agency for Research on Cancer, or by OSHA.

        (8) Any generally applicable precautions for safe handling and use which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks.

        (9) Any generally applicable control measures which are known to the chemical manufacturer,

importer or employer preparing the material safety data sheet, such as appropriate engineering controls, work practices, or personal protective equipment.

(10) Emergency and first aid procedures.

(11) The date of preparation of the material safety data sheet or the last change to it.

(12) The name, address and telephone number of the chemical manufacturer, importer, employer or other responsible party preparing or distributing the material safety data sheet, who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

2. Maintenance requirements:

a. The 29 Code of Federal Regulations (29 CFR) requires all employers to maintain copies of the required MSDS for each hazardous chemical in the work place, and that these copies be readily accessible during each work shift to employees when they are in their work areas.

J. SUMMARY: The Material Safety Data Sheet is the primary source of information concerning hazardous chemicals used in and around the work place. The information in this lecture has been provided to familiarize personnel with the purpose, content and maintenance requirements of MSDS.

K. QUESTIONS AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-19.2

HAZARDOUS MATERIALS IN THE WORK PLACE

A. LESSON NUMBER: G-19.2

B. TIME: 1 Hour

C. DATE PREPARED: 15 January 1993

D. DATE REVIEWED: 7 February 1997

E. TITLE: HAZARDOUS MATERIALS IN THE WORK PLACE

F. OBJECTIVE: To familiarize Employees with methods and observations which may be used to detect the presence or release of a hazardous chemical in the work area; The physical and health hazards of the chemicals in the work area; The measures employees can take to protect themselves from these hazards and the procedures which the employer may implement to protect employees from exposure to hazardous chemicals.

G. INSTRUCTIONAL AIDS: Appropriate instructional aids shall be selected at the unit level.

H. REFERENCES:

1. 29 CFR 1910.1200 (Hazard Communication Standard).

2. NAVAIR A1-NAOSH-SAF-000/P-5100-1 (NAVAIROSH Requirements For The Shore Establishment).

3. OPNAVINST 4790.2 (Naval Aviation Maintenance Program).

4. OPNAVINST P5100.23B (Navy Occupational Safety and Health Program Manual).

I. PRESENTATION: The following definition of "HAZARDOUS MATERIAL" is one of many. However, all hazardous material definitions basically say and mean the same thing; "This stuff will harm you or the environment or both". A hazardous material is: "Any material, which because of its quantity, concentration, physical, chemical, or infectious characteristics, may pose a substantial hazard to human health or the environment when released or spilled". Because of this, it is imperative that individuals working in areas where hazardous materials are being stored and or used, become familiar with those materials (to include their visual appearance and odor), their physical and health hazards, and

appropriate personal protective equipment which may be used to safeguard against overexposure.

NOTE:
THIS LESSON IS PART OF A SERIES OF LESSONS CONCERNING THE HAZARD COMMUNICATION PROGRAM. LESSONS G-19 AND G-19.1 SHOULD BE REVIEWED WITH THE STUDENT PRIOR TO THIS LESSON BEING GIVEN.

1. Detection

    a. Training of personnel in the detection of hazardous materials is most effectively accomplished through recognition (show and smell) training IAW Ref (a)

    b. Administrative methods of training include review of applicable MSDS and other associated publications such as the NAOSH Pocket Guide to Chemical Hazards. These publications contain vital information related to the physical description of hazardous materials including their color, physical properties (gas, liquid, or solid) and odor.

    c. Situation awareness is the key factor in the detection of hazardous materials, which may have been inadvertently released. Particular attention must be paid to any unusual odors detected and to any substance, which appears to be out of place.

2. Physical and Health Hazards

    a. Physical Hazards

        (1) Fire and explosion are the major physical hazards associated with the use of most hazardous materials. However, physical hazards will vary depending on the chemical and physical properties of the material. The following chemical and physical properties should be considered in determining the potential for danger:

(a) MW: Molecular weight

(b) BP: Boiling point

(c) SOL: Solubility in water

(d) FL.P: Flash point

(e) IP: Ionization potential

(f) VP: Vapor pressure

(g) MP: Melting point

(h) UEL: Upper explosive limit

(i) LEL: Lower explosive limit

(j) MEC: Minimum explosive concentration

(2) Reactivity and compatibility should also be considered when using hazardous materials. Many safe and relatively stable materials become very dangerous and highly unstable when mixed with another non-compatible material.

b. Health Hazards

(1) Just as the physical hazards involved with the use of hazardous materials vary, so also do the health hazards. Permissible exposure limits (PEL), routes of entry, and acute and chronic effects must be examined before determining the severity of the health hazards associated with each hazardous material.

(a) Permissible exposure limits are normally based on 8-hour time-weighted-average (TWA) concentrations and indicate the amount of time an individual may be exposed to a particular material.

(b) A route of entry is the means by which a material may enter the human body. There are five toxicologically important routes of entry; Inhalation, skin absorption, ingestion, skin and or eye contact, and injection.

(c) Acute health effects are usually noted as being immediate and severe while chronic effects develop over an extended period of time.

3. Protective Measures and Procedures

a. Unit maintenance procedures should be analyzed by supervisory or safety personnel to assess the hazards present to workers. Procedures may then be developed to remove or control the inherent or manmade hazards. Methods of control include substitution of safer procedures, isolation of hazardous operations, or redesign of the facility.

b. Normally, substitution of safer procedures and isolation of hazardous operations are the only methods available at the unit level. However, personal exposure to hazards may be greatly reduced by using personal protective equipment (PPE). This equipment should not be used as a substitute for the control of unsafe conditions but rather as a supplemental safety measure.

(1) The type of personal protective equipment (PPE) assigned to the employee will depend upon the nature of the hazards involved. Personal protective equipment is classified in the following categories: head, eye/face, respiratory, body/arm, and foot.

(a) Head Protection

1 Helmet or cranial:

a Essential for protection against falling or flying objects as well as providing protection against injury as a result of falling.

(b) Eye and Face Protection:

1 Safety glasses, ventilated goggles, rubber goggles, face shields:

a Worn wherever there is a potential risk of injury to the eyes and face area.

(c) Respiratory Protection:

1 Air-purifying respirators, atmosphere supplying respirators (airline respirators/self-contained breathing apparatus (SCBA)):

a Protection against hazardous atmospheres which are defined as being deficient in oxygen or containing a particulate, gas, or vapor in concentrations which are dangerous to life or health.

(d) Hand and Arm Protection:

1 Synthetic rubber, natural rubber, and general purpose workman's gloves:

a Protection against different contaminants.

(e) Body Protection

1 Coveralls, rubber aprons, protective suits:

a Protection against skin and clothing contamination.

(f) Foot Protection:

1 Steel toed shoes/boots (non-slip soles), rubber over-boots:

a Protection where puncture or falling objects present hazards to feet. Over-boots worn when working where floor is wet with water or chemicals.

c. Review of applicable MSDS and other associated publications such as the NIOSH Pocket Guide to Chemical Hazards should provide the information necessary to select the correct PPE.

d. Employee responsibilities regarding the use of PPE include but are not limited to the following:

(1) Use of the equipment as instructed.

(2) Guarding against damage to the equipment from tears, puncture, and breakage.

(3) Going to "clean areas" if respirators malfunction or clothing becomes torn.

(4) Reporting any malfunction of respiratory protective equipment to the supervisor.

J. SUMMARY: The inherent danger associated with the use of hazardous materials requires employers and employees to be thoroughly familiar with each of the hazardous materials they use. This means that personnel should be able to detect the inadvertent release of a material into the work place as well as being able to determine the appropriate personal protective equipment required for use with the material. A review of applicable MSDS and associated publications such as the NAOSH pocket guide to chemical hazards will provide employees with the information needed to do just that.

K. QUESTIONS AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-19.3

HAZARDOUS WASTE: PROBLEMS, LAWS and POLICIES

A. LESSON NUMBER: G-19.3

B. TIME: 1.0 Hour

C. DATE PREPARED: 15 January 1993

D. DATE REVIEWED: 7 February 1997

E. TITLE: HAZARDOUS WASTE: PROBLEMS, LAWS and POLICIES

F. OBJECTIVE: To familiarize employees with the problems of hazardous waste and to introduce various associated laws and policies, which govern it's handling.

G. INSTRUCTIONAL AIDS: Appropriate instructional aids shall be selected at the unit level.

H. REFERENCES:

1. 29 CFR 1910.1200 (Hazard Communication Standard)
2. NAVAIR A1-NAOSH-SAF-000/P-5100-1 (NAVAIROSH Requirements For The Shore Establishment).
3. OPNAVINST 4790.2 (Naval Aviation Maintenance Program).
4. OPNAVINST P5100.23B (Navy Occupational Safety and Health Program Manual).
5. 40 CFR. (Parts 261 - 265).
6. MCO 5090.2

NOTE:
THIS LESSON IS PART OF A SERIES OF LESSONS CONCERNING THE HAZARD COMMUNICATION PROGRAM. LESSONS G-19, G-19.1, AND G-19.2 SHOULD BE REVIEWED WITH THE STUDENT PRIOR TO THIS LECTURE BEING GIVEN.

I. PRESENTATION: In the past, hazardous waste was seldom if ever the topic of on the job or formal tech training. However, heightened awareness of the effects of hazardous waste on individual health and the environment has created a genuine

requirement for training in this subject. Hazardous waste is basically a hazardous material that has been improperly disposed. It is the improper disposal of this material, which creates the hazardous waste problem. A great number of laws and policies have been developed in an effort to prevent continued improper disposal. Many of these laws and policies apply directly to the types of operations taking place on a day-to-day basis throughout the Marine Corps. Familiarization with these laws and policies will enable employers and employees involved in the disposal of hazardous materials to perform their duties in a manner consistent with good safety practices as well as environmentally sound procedures.

1. Problems:

    a. Lack of sufficient knowledge and background to make independent decisions on the use and disposal of specific chemicals.

    b. Economic and political pressures work against change.

    c. The scientific community is not unified on the effects of toxic and hazardous substances on health and the environment.

        (1) It is difficult for people to determine which chemicals they may be exposed to, what the health effects may be, the type of personal protective equipment they should use, and how significant their exposure may be.

    d. Disposal methods for hazardous waste materials are not satisfactory. The technology required to completely and safely manage every hazardous waste does not exist.

        (1) Incineration

            (a) Cannot handle all materials.

            (b) Operational failure can have devastating environmental results.

        (2) Appropriate landfills are becoming scarce.

(a) Due to Hazardous and Solid Waste Amendments (HSWA) fewer wastes will be allowed to be disposed of by landfill.

(3) It is often cheaper to dispose of waste rather than recycle it.

e. Public misconception of hazardous waste problem.

(1) Some type of "corporate plot" to create chemicals to pollute the environment.

f. Attempts to establish hazardous waste treatment facilities are usually met with a public outcry of "not in my backyard" (NIMBY).

2. Major Problem Areas:

a. Safety and Immediate (Acute) Health effects.

(1) Safety problems, usually accidents, can result in chemical burns, spills, inhalation of toxic fumes, and fires.

(a) Safety hazards that could cause accidents.

1 Inadequate or unused safety and protective equipment.

2 Failure to follow operating procedures, including observing safety zones.

3 Not knowing the dangers of what you are working with.

4 Not knowing who to call or exactly what to do if there is an accident or spill.

5 New people who have not been properly trained and old timers who think they will never get burned.

6 Poor housekeeping.

7 Ineffective or infrequent safety inspections.

8 Not enough space for proper compatible storage.

(b) Safety hazards related to hazardous wastes.

1 Inadequate labeling of containers.

2 Improper, corroded, or leaking containers.

3 Storing incompatible wastes together.

4 Heat or spark sources to close to flammable wastes.

5 Careless or improper transfer of wastes.

6 Improper or insufficient spill cleanup materials.

b. Long Term (Chronic) Health effects.

(1) Long-term effects may result from careless handling of hazardous wastes and may not appear for several years.

(a) Chronic effects:

1 Chronic illness

2 Family illness or behavioral changes due to wastes carried on workers clothing.

3 Latent chronic effects (disease after a waiting period).

4 Cancer.

5 Birth defects.

6 Sterility or other reproductive difficulty.

c. Environmental effects.

(1) Mishandling hazardous wastes can adversely affect plants and animals as well as people. Chemicals from spills or unsafe disposal practices may reach plants, animals, and people by transmittal through surface and or groundwater.

(2) Effects can be serious and long lasting. They can be magnified as they pass through the ecosystem and can be transmitted over great distances.

3. Laws

a. Federal laws and regulations have been developed to protect the environment and your health from hazardous materials. These laws and regulations have been implemented by the Navy and affect how employers and employees do their jobs. Failure to follow the procedures and requirements of these laws and regulations may result in fines and jail terms.

(1) Occupational safety and health.

(a) The Occupational Safety and Health Act (OSHA) of 1970 set requirements for worker safety and health.

(2) Transportation of chemicals.

(a) The Hazardous Materials Transportation Act of 1974 authorized the Department of Transportation (DOT) to issue shipping, labeling, and marking regulations for use during transport of hazardous materials.

(3) Environmental and health protection

(a) The Clean Air Act of 1970

1 Authorized the EPA to control hazardous air pollutants.

(b) The Clean Water Act of 1977

1 Allows the EPA to set water quality and effluent discharge standards for water pollutants.

(c) The Resource Conservation and Recovery Act (RCRA) of 1976

1 Controls the management of hazardous wastes.

(d) The Toxic Substance Control Act of 1976.

1 Gave the EPA authority to regulate chemicals used in commerce.

(e) The Comprehensive Environmental Response, Compensation and Liability Act of 1980

1 Known as the Superfund.

2 Requires reporting of hazardous substance disposal sites and areas made hazardous by oil spills, including those on federal property.

(f) The Hazardous and Solid Waste Amendments of 1984

1 Revised RCRA and mandated changes designed to protect the nation's groundwater.

(g) The Superfund Amendments and Re-authorization Act of 1986

1 Revised CERCLA and included a Community "Right To Know" provision as well as specific mandates to OSHA and DOT to address problems of hazardous waste management.

b. All of these laws not only regulate how you handle hazardous wastes, but also prescribe fines and jail terms for failure to act properly. These fines may be levied directly against the Navy, the activity commander, and the individual handler.

4. Policies:

a. To comply with these laws and regulations, the Navy has adopted policies and prepared requirements which detail how the Navy will handle, store, and arrange for the disposal of hazardous waste.

(1) Presidential Executive Orders.

(a) Executive Order 12088 (Federal Compliance with Pollution control Standards)

1 States that each executive agency is responsible for compliance with pollution control standards established in Federal environmental statutes, and must cooperate with state and local agencies concerning the prevention, control and abatement of environmental pollution.

(2) Department of Defense Policy Statement and Documents.

(a) DOD Directive 5100.50 (Protection and Enhancement of Environmental Quality).

1 Assigns responsibilities and establishes DOD policies for the protection and enhancement of environmental quality.

(b) DOD Instruction 4120.14 (Environmental Pollution Prevention, Control and Abatement).

1 Implements the President's policy statement concerning environmental protection and daily operations of the DOD.

(c) Department of Defense and Defense Environmental Quality Program policy memoranda

1 Memoranda that have been generated dealing with various environmental

topics such as: disposal, management, handling and storage, and spill residue cleanup.

(d) DOD Regulation 4145.19-R-1 (Storage and Materials Handling).

1 Addresses storage and materials handling of hazardous commodities.

(3) Navy Documents

(a) OPNAVINST 5090.1 (Environmental Protection and Natural Resources Manual).

1 Establishes the Navy's environmental policy, identifies requirements and guidelines, and assigns responsibilities within the Navy for implementing a Navy wide program for the protection of the environment, conservation of natural resources, and the preservation of cultural and historic resources.

(b) NAVSUPINST 5100.27 (Navy Hazardous Material Control Program).

1 Establishes policy and procedures, and assigns responsibilities for the Department of Navy Hazardous Material Control Program.

(4) Marine Corps Orders and Bulletins

(a) MCO P11000.8 (The Real Property Facility Manual).

1 Sets the environmental policy for the Marine Corps.

(b) MCO 6280

1 Concerns the establishment of the Marine Corps Hazardous Materials Environmental Management Program

(5) Military Installation Instructions/Orders and Activity Instructions/Orders.

(a) All military installations and most activities have their own instructions/orders concerning environmental, safety, and supply aspect of handling hazardous materials and hazardous wastes.

J. SUMMARY: Hazardous wastes pose a number of very serious problems to individuals, society and the environment. The Navy/Marine Corps team generates large quantities of hazardous wastes but it is the "Handler" of these wastes who is responsible for preventing these serious problems. Failure to comply with legal requirements and failure to follow Executive Branch policy statements and guidance documents concerning hazardous waste can have serious consequences for the Navy and the responsible individuals. These serious consequences include being exposed to enforcement actions and being subjected to legal sanctions. Even though the activity commander is responsible for compliance; the handler, supervisor, and manager can be prosecuted in cases of willful violations of environmental laws and regulations.

K. QUESTIONS AND ANSWER PERIOD:

UNITED STATES MARINE CORPS

AVIATION TRAINING BRANCH
TRAINING COMMAND
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5050

LESSON GUIDE NUMBER: G-20

NALCOMIS

A. LECTURE NUMBER: G-20

B. TIME: 1 Hour

C. DATE PREPARED: 1 November 1995

D. DATE REVIEWED: 7 February 1997

E. TITLE: NALCOMIS

F. OBJECTIVE: To familiarize personnel with the Naval Aviation Logistics Command Management Information System (NALCOMIS) at the Intermediate Level.

G. INSTRUCTIONAL AIDS:

1. NALCOMIS Phase II Desk Top Reference Guide WC.

H. REFERENCES:

1. OPNAVINST 4790.2_

2. NALCOMIS Users Manual J-004 UM-002

I. PRESENTATION: NALCOMIS provides the Intermediate Maintenance Activity (IMA) and Supply Support Center (SSC) activities with a modern real time responsive computer based management information system. This system is designed to increase aircraft readiness by providing local maintenance and supply managers with timely and accurate information required in their day-to-day management and decision-making process. In addition to reducing the administrative burden on the fleet by automating maintenance documentation, NALCOMIS has been successful in improving the quality of up-line reported data.

1. NALCOMIS IMA

   a. The major functions of NALCOMIS in support of both IMA and SSC are divided into ten subsystems, each

NOTE:
AN ON-LINE TUTORIAL IS AVAILABLE FOR ALL CONVERSATION CODES BY ENTERING AN "H" IN THE ACTION FIELD.

of which contain conversation codes that begin with an "N", example: N213. The subsystem menu appears after you have entered your password on the NALCOMIS banner screen. To satisfy the needs of the work center, particular attention must be given to Subsystem 2 with a working knowledge of some of the conversation codes contained in Subsystems 6 and 8.

(1) Maintenance Activity (Subsystem 2)- those functions and processed necessary for you to manage and maintain aircraft components and support equipment. This subsystem provides you with the ability to perform fully automated processing of the Maintenance Action Forms (MAF) in accordance with the policies described in the NAMP.

(2) Material Requirement Processing (Subsystem 6)- the functions associated with receiving and processing material demands in support of maintenance activities. Provides information for the rapid processing of material requisitions for repairable components, consumables, and indirect support items. Maintains the current status of all requisitions and provides management with timely status information.

(3) System Support (Subsystem 8) - Communication between organizations is handled by System Support through the maintenance of on-line messages to the appropriate organization. The coordination supplied by the System Support Subsystems results in the timely and effective flow of information. Also used to review requests for reports and release for subsequent printing.

b. The NALCOMIS Data Base Administrator (DBA) is a key person within the squadron. The performance of the DBA has a direct impact on the integrity of the database. Duties and responsibilities of the Data Base Administrator include:

(1) Troubleshooting conversation aborts.

(2) Periodically checking the Queue containing user Batch Requests.

(3) Maintaining control of system security including Passwords, Special Maintenance Qualifications (SQM's) and Transaction Security Files.

c. For the maintenance person, the Maintenance Activity is the subsystem where you have the most contact with NALCOMIS. Actual documentation requirements (validation specifications, form discrepancies, block entry requirements, etc.) are contained in the OPNAVINST 4790.2_ and other instructions.

(1) Individual Component Repair List (ICRL). An automated ICRL is developed and maintained in NALCOMIS. When using this feature, you can add (N201), delete, or change (N202) data for the repair activity's ICRL. Standard records (BE4) are also produced for forwarding to the Aviation Supply Office (ASO) any changes in repair capabilities. ICRL reports are produced in any of several different formats, depending upon the needs of the requester.

(2) Aeronautical Material Screening Unit (AMSU) Screening. Along with the automated ICRL comes the benefit of automated AMSU screening. You can enter the item's WUC and have NALCOMIS display the current repair (N270/N271). NALCOMIS will also, through calculations, determine if the item being screened is for Expeditious Repair (EXREP) or Low-pool. Items requiring Engineering Investigation (EI) or Quality Deficiency Reporting (QDR) are flagged for special handling.

(3) Indirect Support Material Requirements. You can order items not related to a specific JCN though NALCOMIS. The requesting shop enters the requirement via N204, Material Control personnel validate the data and assign priorities via N205, and the request is passed to Supply.

(4) Maintenance Action Documentation. All existing types of maintenance actions, including inspections (N242), work requests (N245), assists (N246), cannibalizations (N247/N254), technical directives (N276), and equipment

discrepancies (N240), are included in NALCOMIS. Until organizational-level activities implement NALCOMIS, most maintenance actions will be transferred from the MAF to NALCOMIS at the AMSU, when the item is screened for induction. Organizational-level activities on NALCOMIS have the ability to electronically transmit a Turn-in MAF to the IMA. Others, including GSE discrepancies, test bench discrepancies, suffix MAF's, etc., are initiated on the ALCOMIS terminal by IMA personnel. The discrepancy's primary form of identification is now the MAF Control Number (MCN). Once the MAF is entered, all transactions against the discrepancy are entered via the keyboard. The MCN is electronically forwarded to PC for approval, then to the work center assigned to complete the job. Work center personnel enter accumulated man-hours, requisition replacement parts, initiates discrepancies against repairable sub-assemblies, and complete documentation requirements, all on the keyboard. Local status of requisitioned material is displayed on-line. Passing of the MCN between IMA and Awaiting Parts (AWP) section is handled automatically. Throughout the repair cycle, the MCN data is accessible to maintenance and supply managers as part of the workload database. Several on-screen and batch reports are used to assist them in their tasks. After being signed-off by the work center, QA, PC, and Data Analysis, the MCN data becomes part of the historical file for the activity, and is used for up-line reporting.

2. Procedures routinely encountered within NALCOMIS IMA.

   a. Work Center Clearing Procedures:

      (1) Worker completes MCN by changing job status to JC and enters hours via N259.

      (2) N816 mailbox message generated for CDI.

      (3) CDI approves/disapproves MCN via N264.

      (4) N818 mailbox message generated for supervisor.

(5) W/C supervisor checks MCN for accuracy and completeness via N213.

(a) If supervisor cannot correct MCN in N258, MCN is disapproved via N264 and is placed in M3.

(6) Supervisor approves MCN in N264 to generate N817 mailbox message for P/C to end procedure.

b. Repair Flow Process: No Parts Required

(1) Supervisor views W/C workload to select job priority in N211.

(2) Worker updates job status as required and enters name, shift, toolbox, and date via N259/N260.

(a) Ensure after updating job status, a "Y" is entered in ADD WORKERS/HRS field prior to transmitting when using N259.

(3) When job is complete, worker signs off MCN in N261.

(4) CDI/Supervisor initials toolbox in N263.

(5) Perform work center clearing process.

c. Repair Flow Process: Consumable Part Required

(1) Supervisor views W/C workload in N211.

(2) Worker determines parts are required; updates job status to WS and enter worker data using N259/N260.

(3) Verification of FSCM/PN done through N203.

(4) Worker orders required part in N251. Override if necessary.

(5) N802 mailbox message generated for PC.

(6) Production Control approves part requirement via N252.

(a) DDSN assigned by system and job status changed to WP if current job status is WS.

(7) W/C supervisor views document status via N680.

(8) ISSIP status denotes that part is on station and when received work can continue.

(a) INPRO and PREFER status denotes DDSN is passed off station.

(b) CANCL status prompts supervisor to resolve with Supply and reorder as required.

(9) AWPU performs receipt on board and proof of delivery.

(10) AWPU releases component to W/C via N646.

(11) If job is complete, perform work center clearing process.

d. Repair Flow Process: Part Required - Level 2

(1) Supervisor views W/C workload in N211.

(2) Worker determines parts required, updates job status to WS if work stoppage, and enters workers data.

(3) Worker verifies part number is in database using N203/N679.

(a) If part number does not exist, verify part number with IPB to ensure correctness.

(b) If ordering correct part and error message still exists, provide complete/accurate reference and have TEC EDIT load part number. Do not override.

(4) Workers orders required part in N251.

(a) Repairable part generates N802 mailbox message for PC.

(5) Create Turn-In. Complete 2ND screen of N251.

(6) Production Control approves part requirement via N252.

(a) DDSN assigned and job status changed to WP if current job status is WS.

(b) Repairable part generates N831 mailbox message for AMSU.

(7) Turn repairable in to AMSU for induction.

(8) W/C supervisor views document status via N680.

(9) ISSIP/ISSER status denotes that part is on station and when received work can continue after AWPU performs receipt on board and proof of delivery.

(a) CANCL status prompts supervisor to resolve with Supply and reorder as required.

(10) INPRO and REFER status denotes DDSN is passed off station. Worker must update job status to WT in N260.

(11) Component taken to AWP locker.

(a) Upon receipt of component in AWP, status changed to WQ.

(b) Upon receipt of parts, component status is changed to WB.

(c) Work center is notified to pick up component.

(12) Worker enters worker data and job status in N259.

(13) If job is complete, worker signs off MCN using N261.

(14) Perform work center clearing process.

J. SUMMARY: During this period of instruction we have outlined particular procedures and responsibilities for the execution of maintenance documentation throughout NALCOMIS IMA.

This lesson does not encompass all the processes performed by NALCOMIS, but offers a standard starting point for the maintenance worker. For NALCOMIS to be an effective tool, diligent supervision at the work center level must include rigidly adhering to the procedures and policies established by the NAMP. Although AV3M data is the report card to the fleet, NALCOMIS Phase II provides an automated system that greatly enhances the documentation of maintenance and monitoring of the total test/check and repair activity within the IMA, as well as providing data to higher level managers.

K. QUESTION AND ANSWER PERIOD: